The purpose of the WPC 2013 is to create a worldwide dialogue to discuss the multifaceted problems of Parkinson’s disease (PD), propose solutions including new approaches to research, build innovative collaborations and create better treatment options for people with PD. It is the only meeting in the field of PD that addresses a need to bring the whole PD community together for high-level scientific sessions and discussions on current work being done to advance science, improve care for people with PD and help sensitize researchers to the needs of people with PD and conversely help people living with PD understand the challenges researchers and health professionals face in their effort to find a cure and offer better care.

**WPC 2013 Conference Secretariat – JPdL International**

1555 Peel, Suite 500, Montréal, Québec H3A 3L8 Canada
Tel: +1 514 287-9898, ext. 300 – Fax: +1 514 287-1248
secretariat@worldpdcongress.org

The Secretariat is hired by the World Parkinson Coalition to help organize the planning and logistics of the congress, including program management, speakers and poster presenters, official publications, registration and housing, exhibitors, sponsors, tours, social program and other onsite details.

**World Parkinson Coalition Inc.**

1359 Broadway, Suite 1509, New York, NY 10018 USA
Tel: +1 800 457-6676 – info@worldpdcongress.org
www.worldpdcongress.org

WPC Inc. is the nonprofit organization that is responsible for running the triennial Congresses. WPC Inc hires the secretariat, runs the website, connects with organizational partners, is fully responsible for the meeting design including the program content, selection of faculty, renewal room, video competition and all social activities held during the Congresses.
Dear friends:

On behalf of the WPC 2013 Steering Committee and the Board of Directors of the World Parkinson Coalition, we welcome you to the Third World Parkinson Congress and to Montreal, Canada. The theme for this Congress, *Advancing Science, Inspiring Hope, Connecting Community*, sums up the meeting, touching on the three areas that have been front and center during the planning phase of the program design, social events and all other aspects of the Congress.

WPC 2013 will once again unite the global Parkinson community for a high-level, inspirational Congress with one pre-congress day and three days of plenary sessions, workshops, roundtables, and discussions on the most recent and cutting edge scientific and clinical research as well as advances in care and quality of life for people living with Parkinson’s disease (PD).

We have registrants from over 60 countries including people living with PD, caregivers, neuroscientists, clinicians, nurses, allied health professionals, policy makers and others. Our 166 Organizational Partners from 44 countries have graciously endorsed the Congress and, by so doing have helped to ensure the success of the WPC 2013 and the diversity of our delegates.

Be sure to visit the exhibit area to view the 600 plus scientific and living-with-Parkinson’s posters. We encourage you also to visit exhibitors, from both industry and non-profit Parkinson’s organizations from around the world. While there, plan to stop by the Creativity & PD Theater, where members of the community will showcase their submissions to the video competition. For those of you interested in learning about clinical research, visit our Clinical Research Village, where science will meet advocacy and where experts, both researchers and clinical trial participants, will be available to talk about clinical trials, why we need them, how you can help and what you need to know before signing up. If you need a break from the science, visit the Renewal Room for a session on yoga, dance or singing or perhaps you might like to sign up for a session of Reiki massage in our massage room.

The World Parkinson Congresses are the only global conferences that bring together the entire Parkinson community, including the dedicated researchers and health professionals who study the disease and care for those who live with it, alongside the people and caregivers who live with Parkinson’s day in and day out – the real experts.

This is just the third time the WPC has convened. We expect to follow the success we’ve had at the previous WPCs, as we continue to build a stronger, more cohesive PD community with a better understanding of Parkinson’s and the treatment options currently available, always looking forward to newer advances and moving closer to a cure. We hope you will take advantage of this unique learning opportunity and mingle with the different members of the Parkinson’s community.

This is a meeting of hope. The hope for a cure, and until that cure comes, the hope for a better quality of life for our friends, family members, and patients who live with Parkinson’s.

We look forward to meeting many of you during the Congress.

Sincerely,

Stanley Fahn, M.D.  A. Jon Stoessl, C.M., M.D., FRCPC

WPC 2013 Co-chair  WPC 2013 Co-chair
Dear friends:

On behalf of the Program Committee, we thank you for your participation in the third World Parkinson Congress this week in Montreal, Canada. The process of creating this program started almost three years ago with the selection of the outstanding members of the Program Committee who worked extensively to build the program you now hold in your hands.

Our goal was to create a vibrant and comprehensive program that would appeal to our diverse audience. We did this by first selecting the most important and exciting topics being discussed and researched today and then by inviting experts from the global community to share their knowledge and experience on these very topics. We not only wanted you to feel inspired by the research, and hopeful for where it will lead us, but also for you to learn valuable information you could start using as soon as you returned home.

Sessions were created for people with Parkinson’s and caregivers, neuroscientists, clinicians and movement disorder specialists, nurses, rehabilitation specialists and others. We organized a pre-congress day on October 1st with three day-long courses followed by the core program which begins each morning on the 2nd, 3rd, and 4th with Hot Topics presentations at 8AM highlighting some of the outstanding poster abstracts we received this year followed by the daily morning plenaries which have been structured for maximum cross-fertilization of the diverse delegate body. Following these plenaries, each afternoon we have early afternoon and late afternoon tracks with large audience parallel sessions, smaller workshops, roundtables and poster sessions that build upon and explore the topics raised earlier in the morning. For our French-speaking friends, we have a track each afternoon that will be delivered in French by some of the world leaders and we will offer simultaneous interpretation in French for the morning plenaries, special lectures and daily wrap-up.

In addition to the various sessions and workshops, we are offering special sessions over lunch each day, including our first ever James Parkinson Lecture to be delivered on Thursday, October 3 by Dr. Warren Olanow. If you need a break from the science, please visit the the Renewal Room where you can try your hand at yoga, movement therapy, singing, dance, clay therapy, or even tai chi. Just around the corner, you’ll find rooms where you can experience the unique therapeutic benefit of Reiki or meditation. If you need some film inspiration, you’ll find video in the exhibit hall Creativity & PD Theater as well as our Film room where documentaries will be playing all afternoon each day.

We hope you are inspired to join us each and every day and that you make the most of your time at the WPC 2013.

Welcome to Montreal.

Warm regards,

Serge Przedborski, M.D., Ph.D.  
Chair, Program Committee

Oscar Gershanik, M.D.  
Co-chair, Program Committee

Bastiaan Bloem, M.D., Ph.D.  
Co-chair, Program Committee

Israel Robledo  
Co-chair, Program Committee
Dear friends:

As the first group of Ambassadors for the World Parkinson Congress we represent a global community of people with Parkinson’s. Because we know how important WPC 2013 can be, we took our role seriously and literally traveled the world to invite neuroscientists and nurses; physiotherapists and physicians; those seeking a cure and those seeking to care. We invited you to Montréal. You heard us, you responded, and here you are. You need to know that, whatever your reason for coming, your presence is an inspiration to us, as well as to millions of others who gain hope and encouragement from your passion to help in the battle against Parkinson’s disease.

You see, each of us spend much of our time fighting this dogged disease alone. PD was not our choice. It is not just a matter of the head with its faulty messaging to the limbs. It is not just stiffness and tremors, fatigue and falling, or pain and poverty of movement. It is a disease that invades our hearts and robs us of our spirit, our joie de vivre, our confidence. And when that loneliness strikes again in the middle of some dark winter’s night when we cannot sleep, we need the memories we will take from this place. We will replay our remembrances of seeing the pride and passion you display when speaking of advances made; memories of the sweat and strain you expend on our behalf; and recollections of the hope and help we gained by looking in your eyes.

And so we welcome you, and sincerely thank you for making people with Parkinson’s your priority. We hope to meet you all personally as we share the information and inspiration of the Third World Parkinson Congress. So please, make new friends as you enjoy this country, this city and this Congress. Friendships make the best memories.

Sincerely,

WPC 2013 Ambassadors

Fulvio Capitanio
Barcelona, Spain

Tim Oneschkow
Berlin, Germany

Jin Kyoung Choae
Seoul, South Korea

Sara Riggare
Stockholm, Sweden

Sharon Daborn
Melbourne, Australia

Israel Robledo
Texas, USA

Steven DeWitte
Connecticut, USA

Jon Stamford, Ph. D.
London, UK

Robert Kuhn, JD
Vancouver, Canada

Yvon Trepanier
Ontario, Canada

Margaret Makoutonina,
M.Edu, B.AppSc
Melbourne, Australia

Ryan Tripp
Ontario, Canada
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David Burn, MD, FRCP
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Günther Deuschl, MD
Robin Elliott
Marian Emr
Joyce Gordon
Tom Isaacs
Joseph Jankovic, MD
Knut-Johan Onarheim
Ryujl Kaji, MD, PhD
Anne-Louise Lafontaine, MD, MSc
C. Warren Olanow, MD
Michel Panisset, MD, DEA
Gianni Pezzoli, MD
Werner Poewe, MD
Serge Przedborski, MD, PhD
Edward Fon, MD, FRCP(C)
Karl Friedl, PhD
Thomas Gasser, MD
Etienne Hirsch, PhD
Ryujl Kaji, PhD
Jeffrey Kordower, PhD
Beth-Anne Sieber, PhD
Maria Spallini, PhD
Miquel Vila, MD, PhD

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Paolo Calabresi, MD
Marie-Françoise Chesselet, MD, PhD
Ted Dawson, MD, PhD
Stanley Fahn, MD
Edward Fon, MD, FRCP(C)
Karl Friedl, PhD
Thomas Gasser, MD
Etienne Hirsch, PhD
Ryujl Kaji, PhD
Jeffrey Kordower, PhD
Beth-Anne Sieber, PhD
Maria Spallini, PhD
Miquel Vila, MD, PhD

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Victor Fung, MD
Joseph Jankovic, MD
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Anthony Lang, MD
Irene Litvan, MD
Laura Marsh, MD
Michel Panisset, MD
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Alessandro DiRocco, MD
Terry Ellis, PhD, PT
Sandra Funk, BSW, RSW
Monique Giroux, MD
Ruth Hagestuen, RN
Robert Jansej, MD
Lucie Lachance, RN
Margaret Makoutonina, OT
Linda Morgan, R.Ph, MBA
Marten Munneke, PT, PhD
Barbara Snelgrove
Jon Stamford, MD
Alice Tempelin, BSc (PT)

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Fulvio Capitanio
Hayley Carpenter
Tom Isaacs
Linda Morgan, RPh, MBA
Sara Riggare

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Sarah Humphrey
Anders Leines
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Sara Lew
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Taniith Muller
Karen Northrop
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Ryan Tripp
Greg Wasson, JD
Karim Willemsen
Liz Wolstenholme, OBE

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John Bird
Marian Emr
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Nikki Hegarty
Emily Hughes
Martha Joseph
Bob Kuhn, JD
Sandra McPherson, PhD
Deirdre O’Sullivan
Diane Robinson
Annie Turcot

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Michel Panisset, MD, DEA, Co-Chair
Kim Bartlett
Nicole Charpentier
Sylvain Chouinard, MD
Sarah Humphrey
Christian Lepage, MD
Lucie Lachance, BSc(N), MSc

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Wolfgang Oertel, MD, PhD
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Olivier Rascol, MD, PhD
Kapil Sethi, MD, FRCP
Debra Shaw
Fabrizio Stocchi, MD, PhD
Oksana Suchowersky, MD, FRCP
Eduardo Tolosa, MD

AUDIT COMMITTEE

Jim Horwich, Chair
Robert Gardino, MBA

WORLD PARKINSON COALITION INC.

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President: Stanley Fahn, MD
Secretary: Serge Przedborski, MD, PhD
Treasurer: Robert Burke, MD
Members: Marie-Françoise Chesselet, MD, PhD
Patricia Davies
A. Jon Stoessl, CM, MD, FRCP

Executive Director: Elizabeth Pollard
Legal Counsel: Jerry Terrill
Partners Coordinator: Karen Northrop
Intern: Christiana Thurton
BADGES
Health Professionals
Non-health Professionals
Accompanying Person
Media
Exhibitor Staff (floor only)
Volunteers/Registration Staff

One-day registrants are shown with a star on their badge. Badges are required at all times on site for room access and identification.

BANKING AND EXCHANGE FACILITIES
Banks and bank machines (automatic tellers – ATMs) can be found throughout the city. Regular banking hours are 10 AM to 3 or 4 PM, Monday to Friday, with extended hours including weekends at some locations. Currency exchange offices are plentiful in the downtown core. Main branches of Canadian banks are equipped to exchange foreign currency as well. Most banks have automatic teller machines (ATM), which can be accessed 24 hours a day, using bank or credit cards on major international banking networks such as Cirrus, Plus and Interac.

BUSINESS CENTRE
For business supplies, services and printing near the Palais des congrès, see:
- Staples/Bureau en gros: 895 de la Gauchetière West (in Central Train Station lobby area), tel: +1 514 879-1515
- Staples/Bureau en gros: 770 Notre Dame Ouest (corner University and Notre-Dame), tel: +1 514 875-0977
- MP Reproductions Inc.: 1030 Cheneville (north side of Palais des congrès), tel: +1 514 861-8541

CAR PARKING
Indoor parking is available at the Palais des congrès, on Viger Avenue (via Chenneville Street) and on St. Antoine Street.

CERTIFICATE OF ATTENDANCE
An official Certificate of Attendance will be provided after the close of the Congress to all delegates who attended in Montréal.

CLOAKROOM (VIGER HALL, LEVEL 2)

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
</tr>
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<tbody>
<tr>
<td>Tuesday, October 1</td>
<td>7 AM – 6:30 PM</td>
</tr>
<tr>
<td>Friday, October 4</td>
<td>7 AM – 6:30 PM</td>
</tr>
</tbody>
</table>

Costs: $2.00 per piece of luggage or piece of clothing.

DISCLAIMER
The participant acknowledges that he/she has no right to lodge damage claims against the Organizing Committee should the Congress be hindered or prevented by unexpected political or economic events or generally by Acts of God, or should the nonappearance of speakers or other reasons necessitate program changes.

DRESS CODE
You may dress informally for the Congress. The dress code for the Welcome Reception is also informal.

ELECTRICITY
Electricity in Canada is 110V and the plugs are the same as in the U.S. If you come from a country that uses 220V electricity, a converter will be required for any appliances you bring along.

EMERGENCIES & FIRST AID
In case of emergency the red internal-use telephones located throughout the Palais des congrès will put you in direct contact with the building’s security operations centre.

EXHIBITION (ROOM 220CDE)

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
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<tbody>
<tr>
<td>Tuesday, October 1</td>
<td>7:30 PM – 9:30 PM</td>
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<tr>
<td>Wednesday, October 2</td>
<td>11 AM – 6:45 PM</td>
</tr>
<tr>
<td>Thursday, October 3</td>
<td>11 AM – 6:45 PM (all posters to be removed by 6:45 PM)</td>
</tr>
<tr>
<td>Friday, October 4</td>
<td>11 AM – 2 PM</td>
</tr>
</tbody>
</table>

See pages 84 to 95 for full list of exhibitors, booth descriptions and floor plan.

EVALUATIONS
All participants are invited to complete evaluations for the Congress and each session they attend. Forms for individual sessions are available in the meeting rooms. A general evaluation survey for the whole congress will be sent to delegates after the congress dates.

FOOD SERVICES
Starting on Wednesday, coffee stations and food concessions are open to delegates in the Palais des congrès, both in the Exhibit Hall (level 2) and in the lobby of the meeting room floor (level 5). Coffee and tea are offered free of charge in the Exhibit Hall during the afternoon break. In addition, a large number of restaurants for all budgets are available for conference participants within easy walking distance from the Palais, including the metro (subway) level of the Palais, Chinatown (on De la Gauchetière Street), Complexe Guy-Favreau (immediately north of the Palais des congrès) and Complexe Desjardins (corner René-Lévesque and St-Urbain, also accessible through RESO/underground city from Complexe Guy-Favreau).
Internet Access
Internet access is available inside the Palais des congrès. Network name and Password: wpc_2013

Language and Simultaneous Interpretation
- English to French simultaneous interpretation available
- Session in French (no simultaneous interpretation)

Although the official language of the Congress is English the opening ceremony as well as all morning plenary sessions will include simultaneous interpretation services into French. Additionally, all French Track presentations are offered exclusively in French. Simultaneous interpretation into French is also available for the pre-congress course I “Fundamentals of PD”.

Headsets will be distributed onsite (official ID required).

Map and Floor Plans
See pages 108-109 for Palais des congrès floor plans and page 110 for map of downtown Montréal.

Media Room (Room 523B)

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
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<tbody>
<tr>
<td>Tuesday, October 1</td>
<td>7 AM – 6 PM</td>
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<tr>
<td>Wednesday, October 2</td>
<td>7 AM – 6 PM</td>
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<tr>
<td>Thursday, October 3</td>
<td>7 AM – 6 PM</td>
</tr>
<tr>
<td>Friday, October 4</td>
<td>7 AM – 6 PM</td>
</tr>
</tbody>
</table>

This room will be open to approved members of the media who are covering the WPC for their respective publications. (See also Press Briefing room below.) Media badge is required to access this room.

Meditation Room (Room 525B)

Meditation is a universal spiritual wisdom and practice that we find at the core of all the great religious traditions, leading from the mind to the heart. It is a way of simplicity, silence and stillness. Simplicity is letting go of self-analysis, silence is letting go of thought and stillness is letting go of desire. It can be practiced by anyone from anywhere you are on your journey. It is only necessary to be clear about the practice and then to begin – and keep on beginning. Try meditation for the first time or join this space as a practiced meditator. The space will be there for delegates who want to take a break from the science and rigor of each day.

Meditation Schedule (Wednesday, Thursday, and Friday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 AM – 12:30 PM</td>
<td>Instructed session &amp; meditation</td>
</tr>
<tr>
<td>1 PM – 3 PM</td>
<td>Free discussion with meditation instructor</td>
</tr>
<tr>
<td>3:15 PM – 4:15 PM</td>
<td>Instructed session &amp; meditation</td>
</tr>
<tr>
<td>5:10 PM – 5:35 PM</td>
<td>Silent meditation, no talking</td>
</tr>
</tbody>
</table>

Mobile App
Download the free WPC 2013 mobile app and carry the WPC program and side activities in the palm of your hand on your smartphone or tablet. You can set up your agenda, review speaker bios, connect with others, take notes and more!

Visit the App Store online and look for World Parkinson Congress 2013.
Scan to download our mobile app

Mobile Phones
Mobile phones must be switched off or muted in the session meeting rooms.

Parkinson’s Quilt Project (Foyers 510-511 and 517)
Shown for just the second time in its entirety at the WPC 2013 (initially unveiled at WPC 2010), the Parkinson’s Quilt Project, composed of 40 quilts on view in Foyer 510-511, is the first ever global Parkinson’s Quilt designed to recognize and honor the millions of people who live with Parkinson’s globally. The Quilt Project, developed by WPC Partner the Parkinson’s Disease Foundation, was designed to raise awareness of the impact Parkinson’s has on people living with it along with their families, caregivers, and friends as well as on the need for a continued urgency to find a cure. Participants are invited to sign the WPC 2013 quilt and view the WPC 2010 signature quilt in Foyer 517.

Photography and Videotaping
Photography and videotaping are not permitted in any of the oral sessions, nor at poster sessions, without the permission of the relevant oral presenter or authors of the poster.

An official photographer/videographer will be on site to capture the essence of the congress for the WPC web site and records. These images may be used for promotion of the World Parkinson Coalition.

Posters (Room 220C)
Posters will be displayed in the Exhibit Hall (room 220CDE) starting Tuesday evening during the welcome reception. Official poster sessions are scheduled on Wednesday and Thursday from 11:30 AM to 1:30 PM, at which time poster presenters will be stationed by their poster to discuss with delegates. See the poster session program for details on when posters will be hosted. All posters must be removed by 6:45 PM on Thursday.

Poster Tours
Poster tours are held 5:15 PM – 6:45 PM on Wednesday and Thursday, October 2 and 3, at which times a select number of posters will be highlighted for their work. Tour sign-up is required (see sheets in front of main entrance to Exhibit Hall at 220D). See pages 77 to 82 for full list of posters and guides.

Prayer Room (Room 522C)
The prayer room will be open during the registration opening hours from Tuesday to Friday. This is a space where individuals who wish to worship may do so as needed.
Press Briefing Room (Room 523A)
Press briefings will be held daily. A full schedule will be posted in the Media Room and all registered media delegates will receive details via email prior to the Congress. Media badge is required to access this room.

Quiet Room (Room 522B)
The quiet room will be open during the registration opening hours from Tuesday to Friday. For the use of all delegates, this space is for quiet use only to rest, take medications, or read without the interruption of loud talking or performances. This is not a meeting space.

Registration Hours (Viger Hall, level 2)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Monday, September 30</td>
<td>3 PM – 7 PM</td>
</tr>
<tr>
<td>Tuesday, October 1</td>
<td>7 AM – 7:30 PM</td>
</tr>
<tr>
<td>Wednesday, October 2</td>
<td>7 AM – 6:30 PM</td>
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<tr>
<td>Thursday, October 3</td>
<td>7 AM – 6:30 PM</td>
</tr>
<tr>
<td>Friday, October 4</td>
<td>7 AM – 5:30 PM</td>
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</tbody>
</table>

Reiki and Other Massage Room (Room 525A)
This complimentary space and service will offer delegates a break and a chance to experience Reiki massage. Sign-up will be required in the room itself and spots will be offered on a first-come first-served basis. Reiki Masters in the room will be donating their time. Sign-up located outside the room.

Renewal Room (Room 524)
This room is a space during the Congress where everyone is welcome to drop in to rejuvenate during the day with sessions on dance, tai chi, yoga, singing, laughter, clay therapy and more! Sessions vary each day and will require people to sign up ahead of time. To sign up, please visit the room and sign up on the sheets posted outside the entrance. See pages 11 to 13 for full schedule of activities.

Social Media
Connect with other delegates and Congress organizers using social media! We are tweeting and posting on Facebook, so make sure to connect with us to stay informed, hear the latest news, see our newest photos and videos, and have your questions answered:

- Use Facebook to communicate with the WPC: Ask us questions, check out our photos, and connect with the global WPC community!
- The WPC 2013 Twitter handle is @WorldPDCongress – use this to talk directly to us or to mention us in your posts. The WPC 2013 hashtag is #wpc2013.
- The WPC YouTube channel is WorldPDCongress.
- The World Parkinson Coalition Inc., organizer of the World Parkinson Congresses, is available to connect with on LinkedIn. “Follow” our company page to connect to the global Parkinson’s community.
- The WPC has great pictures to share, and you can see them all on Instagram at @worldpdcongress! Join our photo feed by using hashtag #wpc2013.

Speaker Ready Room and Practice Room (Rooms 521A and 521B)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Monday, September 30</td>
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</tr>
<tr>
<td>Friday, October 4</td>
<td>7 AM – 5:30 PM</td>
</tr>
</tbody>
</table>

All invited speakers are requested to go to the speaker ready room to upload their PowerPoint presentation file as soon as they have picked up their name badge and Congress materials. Please arrive at least three hours prior to your presentation.

Computers are available to invited speakers wishing to review or modify their presentation. In addition, room 521B has been set up as a practice room for speakers with a podium and lectern. Speakers wishing to book this space to practice their talk can sign up for the space in the Speaker Ready Room, where speakers can use the presentation management system that is installed in the meeting rooms. Sign-up is required to reserve practice times.

Smoking Policy
Smoking is not permitted in the Palais des congrès nor on any form of public transit, in restaurants and bars, stores, shopping centres, in cinemas, in elevators, in government offices or in banks, and inside office buildings. Many buildings have cigarette disposal arrangements outside. You must be 18 years or older to buy tobacco in Quebec.
Store and Business Hours
The times shown are valid for the majority of businesses. Not all retailers are open on Sunday. Banks have variable hours, depending on location.

- Stores: 9 AM – 6 PM (Saturday, Monday-Wednesday) 9 AM – 9 PM (Thursday-Friday) and 12 – 5 PM (Sunday)
- Banks: 10 AM – 3/4 PM (Monday-Friday)
- Post Offices: 8/8:30 AM – 5/5:30 PM (Monday-Friday)
  Note: Many drugstores/pharmacies offer postal counters with full service.

Transportation
The public transit system in Montréal includes an extensive bus and metro (subway) network for secure transportation throughout the city. The metro has 4 lines, identified by colour and end stations, and city buses run along all major routes in the metropolitan area.

Single fare is $3.00, with a ten-ticket strip costing $24.50. A weekly pass (CAM Hebdo, from Monday to Sunday) is available for $23.75, offering unlimited travel for the days of the card or pass. Passes and tickets are available at all metro stations.

Taxis are plentiful in the city and can be hailed from the sidewalk, at any taxi stand or ordered by telephone. An average ride within the greater downtown area should cost between $8.00 and $12.00, depending on distance. Meters start at $3.45, $1.70 per kilometer and $0.63 per minute.

Volunteers
The WPC would like to thank all the people who have volunteered their time at WPC 2013. Their help before and during the Congress helps make this meeting a success! You can find volunteers wearing the orange WPC 2013 Volunteer t-shirt.

WPC Store at Registration Desk
The WPC store will be open during registration hours and will have a few items for sale:

- PARKY the Raccoon. Stop by to read the story about Parky the Raccoon and pick one up for a friend. All proceeds from the sale of Parky will go to the WPC 2016 Travel Grants Fund. Pass it on!

- WPC 2013 baseball hat. Pick up a WPC hat before they are all gone. Limited item! Buy one for a friend. All proceeds go to planning the WPC 2016.

- WPC 2013 Congress bags. Do you like the Congress bag? Why not buy another one for a friend who could not join you in Montreal. All proceeds go to planning the WPC 2016.

Webcast of Sessions
A select number of WPC sessions will be taped and broadcast via the Internet after they take place. Details on accessing the webcast sessions will be shared during the WPC, on the WPC website after the Congress ends and in the Mobile App. Sessions to be taped and broadcast.

October 1: Opening Ceremony in Room 517ABC
October 2: Hot Topics and Morning Plenary in Room 517AB Afternoon Parallel Sessions in Room 517A Special Lunch Lecture and End of the Day Wrap-up in Room 517D
October 3: Hot Topics and Morning Plenary in Room 517AB Afternoon Parallel Sessions in Room 517A Special Lunch Lecture and End of the Day Wrap-up in Room 517D
October 4: Hot Topics and Morning Plenary in Room 517AB Afternoon Parallel Sessions in Room 517A Special Lunch Lecture and End of the Day Wrap-up in Room 517D

Support for the webcast comes from the National Parkinson Foundation and the Brin Wojicki Foundation
Exhibit Hall (220CDE)
A selection of video artists who submitted a video to the WPC Video Competition have been invited to present their video(s) and to share their story. Grab lunch and join us in this space for some great video viewing and storytelling.

Videos will be shown in this area on a loop throughout the Exhibit Hall hours with the exception of during lunch and evening hours, when live sessions will be held. Please check the Theater area for confirmed details on guest presenters and exact showing times.

Thanks to UCB Pharma SA for supporting the Creativity and PD Theater

**Wednesday, October 2**
- Discussion Panel with artists 11:45 AM – 1:15 PM
- Discussion Panel with artists 5:15 PM – 6:30 PM

**Thursday, October 3**
- Discussion Panel with artists 11:45 AM – 1:15 PM
- Discussion Panel with artists 5:15 PM – 6:30 PM

**Friday, October 4**
- Discussion Panel with artists 11:45 AM – 1:15 PM

Room 710B
**Theatrical Performance**

The Alan Parkinson’s Project is an award winning Canadian musical based on the life of celebrated Canadian playwright Doug Curtis, diagnosed with Young-Onset Parkinson’s disease in 2003. Join us for one of just three showings of this musical at WPC 2013 and watch the story unfold of Alan who is supported in the progression of his Parkinson’s by his devoted and instinctual dog Target, his guardian angel Grace, his Production Assistant Kate, and his medicinal hero El Dopa.

**Documentary Films**

Join us each afternoon for a break from the science to watch films made by and/or about people living with Parkinson’s. Some of the films will be offered as private pre-screenings before they are launched in the film festival circuit. Visit this room for a more detailed schedule of those films to be shown.

See handout in Congress bag for full schedule of all activities.

Thanks to AbbVie for supporting the Performance & Film Room and all activities in the room
Room 524
The Renewal Room is a safe and dynamic space where all delegates can come to nourish mind, body and spirit. Be sure to set time aside to visit the Renewal Room while you are at the WPC 2013.

Water will be available outside the room. If you would like to have water nearby during the sessions, please bring your own water bottle to fill up before the sessions begin.

**Support for the Renewal Room comes from Allergan**

### Wednesday, October 2, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 AM – 9 AM</td>
<td><strong>Early Morning Yoga</strong>, with Kaitlyn Roland (Canada) &amp; Renee Le Verrier (USA)</td>
</tr>
<tr>
<td></td>
<td>Whether you’re new to yoga or practice regularly, this morning session includes chair-supported poses and focused breathing exercises that are specifically designed to target PD symptoms such as rigidity and fatigue. Not only will you start your day with flexibility, strength and balance, the instructors will provide yoga tips on how to re-energize throughout your stay in Montréal.</td>
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<tr>
<td>11:30 AM – 12:30 PM</td>
<td><strong>Movement Lab</strong>, with Pamela Quinn (USA)</td>
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<td></td>
<td>Movement Lab is a dance-based, symptom-solving class that investigates all kinds of movement and games to counteract physical challenges brought on by PD. It begins in chairs and progresses to moving through space. Done to a wide variety of music, it is known for its practical application, its inventive nature and for being fun. Originated and taught by acclaimed PD movement teacher, Pamela Quinn.</td>
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<tr>
<td>12:45 PM – 1:45 PM</td>
<td><strong>Get up and Sing!</strong>, with Jennifer Wetter Grundulis (Ireland)</td>
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<td></td>
<td>Be inspired by the Voices of Hope choir and learn choral singing techniques from warm ups to posture to group singing. Raise your spirits through song.</td>
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<tr>
<td>2 PM – 3 PM</td>
<td><strong>Dance for PD</strong>, with David Leventhal (USA), Maria Portman Kelly (USA) &amp; Linda Hall (USA)</td>
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<td></td>
<td>In Dance for PD® classes, participants explore movement and music in ways that are enjoyable, stimulating and creative. No dance experience is required. In chairs, at a barre or moving across the floor, you will explore elements of modern dance, ballet, tap, folk and social dancing.</td>
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<tr>
<td>3:15 PM – 4 PM</td>
<td><strong>Reclaiming Positive Perspective: A DECIDE SUCCESS Inspirational Talk</strong>, with John Baumann (USA)</td>
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<td>John Baumann’s no nonsense, in your face, self-improvement edicts for those People with Parkinson’s disease and their Care Partners who are absolutely, positively committed to transform themselves and live life to the fullest: Moving Forward.</td>
</tr>
<tr>
<td>4:15 PM – 5:15 PM</td>
<td><strong>Yoga</strong>, with Kaitlyn Roland (Canada) &amp; Renee Le Verrier (USA)</td>
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<tr>
<td></td>
<td>See description at 8 AM.</td>
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<tr>
<td>5:30 PM – 6:30 PM</td>
<td><strong>Trager® work with Parkinson’s</strong>, with Denis Lafontaine (Canada)</td>
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<td>[Bilingual, English &amp; French/bilingue français et anglais]</td>
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<td>This workshop will introduce participants to basic principles of Trager work and demonstrate the beneficial effects of Trager for individuals living with Parkinson’s disease, their care partners and caregivers alike. All participants will learn simple techniques they can use themselves on a daily basis to address rigidity and stiffness, improve stability and balance, and help increase their mobility and flexibility, their ease and fluidity of movement.</td>
</tr>
</tbody>
</table>
### Thursday, October 3, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker/Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 AM</td>
<td><strong>Let Your Yoga Dance</strong>, with Megha Buttenheim (USA)</td>
<td>Let Your Yoga Dance for Parkinson’s is a wonderful blending of BREATH, Yoga movements and moving postures,</td>
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<td>user-friendly dance, t’ai chi, singing, sounding, toning. It has a lovely spiritual and creative component as well.</td>
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<td>This is a Joy-filled practice, targeted for the needs of people with PD.</td>
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<tr>
<td>11:15 AM</td>
<td><strong>Fighting Back Against Parkinson’s</strong>, with Kristy Follmar (USA) &amp; Christine Timberlake (USA)</td>
<td>Rock Steady Boxing is exercise with a PUNCH! Did you know exercise is medicine? Come and learn how to Fight</td>
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<td>Back against Parkinson’s and have some fun too!</td>
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<tr>
<td>12:30 PM</td>
<td><strong>Music &amp; NIA Movement</strong>, with Caroline Kohles (USA) &amp; Amy Lemen, SW (USA)</td>
<td>Neuromuscular Integrative Action (NIA) is an engaging and energetic fitness modality that helps participants to</td>
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<td>connect or reconnect to exercise in a welcoming and encouraging environment where individuality and creative</td>
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<td>expression are encouraged to enhance body awareness, loosens rigidity, stretches stiff muscles, builds strength</td>
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<td>and stability, and promotes relaxation.</td>
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<tr>
<td>1:45 PM</td>
<td><strong>Argentine Tango</strong>, with Nelida Garetto, Juan Firmani, Veronica Litvak, Tomoko Arakaki,</td>
<td>The benefits of dancing for people with Parkinson disease are widely known: external cue to facilitate movement;</td>
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<td>Sergio Rodriguez Quiroga (Argentina) &amp; Debra Rabinovich (Canada)</td>
<td>teaching of specific movement strategies; the balance exercises; and the offer of an enjoyable and socially</td>
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<td>engaging activity. But why TANGO ARGENTINO? Because of the benefits of partner dance: the sensory contact with</td>
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<td>the other, the steps backwards like a mirror, the hug which leads the movement, and the lovely music that</td>
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<td>connects with our bodies in the most intimate and profound way possible. Join us and enjoy it!</td>
</tr>
<tr>
<td>3 PM</td>
<td><strong>Healing Laughter Exercises</strong>, with Peter Davison (Canada)</td>
<td>The physical act of laughing is well known for its holistic, uplifting and healing benefits. You’ll learn and do</td>
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<td>a playful blend of simple, empowering and otherwise “tension-releasing” laughter exercises.</td>
</tr>
<tr>
<td>4 PM</td>
<td><strong>Join the Parkinson’s Exercise Revolution</strong>, with Jillian Carson, PT (Canada), Allison</td>
<td>PWRI Moves train large amplitude everyday movement. They are FuncTional PD-specific exercises that can be done</td>
</tr>
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<td>Conway (USA) &amp; Becky Farley, PhD (USA)</td>
<td>across disease severity. These moves are delivered using techniques to optimize learning by constantly varying the</td>
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<td>challenge or difficulty that requires cognitive/attentional/emotional engagement.</td>
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<tr>
<td>5:15 PM</td>
<td><strong>Let Your Yoga Dance</strong>, with Megha Buttenheim (USA)</td>
<td>See description at 8 AM.</td>
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<td>8 AM</td>
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*Note: The room is RENEWAL.*
### Early Morning Tai-Chi* / Tai-Chi matinal, with/avec Richard Ranger (Canada) & Daniel Loney (Israel)

Experience the basic principles underlying the practice of Tai Chi and how the application of these principles reduces the symptoms of Parkinson’s. The participant will learn how to improve balance, stability, posture, flexibility, coordination, body flow, body/mind awareness and improve lower body strength. In addition, we will analyze the postures and movements within Tai Chi and how the implementation of these movements in daily life can aid in walking, going up and down stairs, turning in place and coping with frozen or Off situations. The participant will also be shown how to negotiate in crowds and prevent falls.

Venez découvrir les grands principes qui sous-tendent la pratique du tai-chi et comment leur application réduit les symptômes liés à la M.P. et procure des bienfaits sur de nombreux plans: équilibre, stabilité, posture, souplesse, coordination, fluidité des gestes, intégration corps-esprit et force des jambes et du bassin. Vous apprendrez aussi comment les mouvements du tai-chi peuvent être des alliés au quotidien, pour marcher, monter et descendre des escaliers, tourner sur place, surmonter les blocages, se frayer un chemin dans une foule et éviter les chutes.

### Merengue: Move on Hot Latin Music*/Meringue: bougez au son de la chaude musique latine, with/avec Diane Côté, RN (Canada)

Let’s party!!! Join us, alone or accompanied, for one of the most versatile dances, easy to learn and fun to do! The dance will focus on walking on the music’s two-beat rhythm... while doing easy moves of your arms. Enthusiasm and high energy will be contagious.

On s’amuse !!! Venez seul ou accompagné, pratiquez l’une des danses des plus versatility, faciles et plaisantes. Nous marcherons sur un rythme à 2 temps tout en y ajoutant de beaux mouvements de bras. Enthousiasme et énergie seront de la partie.

### Voice Therapy, with Audun Myskja, MD (Norway)

Experience voice exercises to aid management of PD symptoms, with a particular emphasis on stress reduction. This workshop will present the opportunities of using the voice as a therapeutic instrument. Participants will be taught voice and movement – a synthesis, voice exercises for relaxation and stress reduction, handling emotions using sound techniques, building a better voice – a systematic approach.

### Clay Therapy, with Deborah Elkis-Abuhoff, PhD (USA)

Experience the creative arts therapy process with modeling clay manipulation. Participants will gain a better understanding of an alternative creative treatment to increase their overall sense of well-being and experience a decrease in emotional symptomology.

### Sometimes you have to just laugh, with Jean Burns (USA) & Sheryl Jedlinski (USA)

Girlfriends Sheryl Jedlinski and Jean Burns are pdplan4life – providing liberal doses of humor and hope while sharing intimate and informative stories about their challenges with and triumphs over Parkinson’s.

### Tai-Chi*, with/avec Richard Ranger (Canada) & Daniel Loney (Israel)

See description at 8 AM./Voir description à 8h.

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<td></td>
<td>(Canada) &amp; Daniel Loney (Israel) [Bilingual, English &amp; French/bilingue</td>
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<tr>
<td></td>
<td>français et anglais]</td>
</tr>
<tr>
<td>11:15 AM – 12:15 PM</td>
<td>Merengue: Move on Hot Latin Music* / Meringue: bougez au son de la chaude</td>
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<td>musique latine, with/avec Diane Côté, RN (Canada)</td>
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<tr>
<td>12:30 PM – 1:30 PM</td>
<td>Voice Therapy, with Audun Myskja, MD (Norway)</td>
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<tr>
<td>1:45 PM – 2:45 PM</td>
<td>Clay Therapy, with Deborah Elkis-Abuhoff, PhD (USA)</td>
</tr>
<tr>
<td>3 PM – 3:45 PM</td>
<td>Sometimes you have to just laugh, with Jean Burns (USA) &amp; Sheryl</td>
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<tr>
<td></td>
<td>Jedlinski (USA)</td>
</tr>
<tr>
<td>4 PM – 5 PM</td>
<td>Tai-Chi*, with/avec Richard Ranger (Canada) &amp; Daniel Loney (Israel)</td>
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</table>

**Prayer Room and Quiet Room Schedule**

**Rooms 522C and 522B**

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Tuesday, October 1</td>
<td>7 AM – 6:30 PM</td>
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<tr>
<td>Wednesday, October 2</td>
<td>7 AM – 6:30 PM</td>
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<tr>
<td>Thursday, October 3</td>
<td>7 AM – 6:30 PM</td>
</tr>
<tr>
<td>Friday, October 4</td>
<td>7 AM – 5:30 PM</td>
</tr>
<tr>
<td>DATE</td>
<td>ACTIVITY/TOUR</td>
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<tr>
<td><strong>Tuesday, October 1</strong></td>
<td>Opening Ceremony</td>
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<tr>
<td><strong>Tuesday, October 1</strong></td>
<td>Welcome Reception</td>
</tr>
<tr>
<td><strong>Wednesday, October 2</strong></td>
<td>“Bonjour Montréal” City Tour</td>
</tr>
<tr>
<td><strong>Wednesday, October 2</strong></td>
<td>Walking Tour of Old Montreal</td>
</tr>
<tr>
<td><strong>Saturday, October 5</strong></td>
<td>Québec City Day Trip</td>
</tr>
<tr>
<td><strong>Saturday, October 5</strong></td>
<td>Walking Tour of Old Montreal</td>
</tr>
</tbody>
</table>

**Opening Ceremony (Room 517ABC)**

All delegates are welcome to join the Opening Ceremony in rooms 517ABC in the Palais des congres. Immediately following the ceremony, all guests are invited to join us in a Welcome Reception to be held in the WPC Exhibit Hall for hors d’œuvres and drinks.

**Welcome Reception in the Exhibit Hall (Room 220CDE)**

All delegates are invited to join the Welcome Reception immediately following the Opening Ceremony. The reception will offer a space where delegates can meet old friends and make new ones while visiting the exhibits, enjoying music and getting a sneak peak at the posters to be presented in the following days.
**Tours**

**BUYING TICKETS:** Tour tickets can be purchased at the tour desk located in Viger Hall (level 2).

**TOUR DEPARTURES:** All tours depart from the Palais des congrès. Meet your group in Viger Hall (level 2) 20 minutes before tour start time.

**MORE INFORMATION:** For details on tour you can visit the tour desk, consult the mobile app or go to the tour web site at [https://events.jpdl.com/ei/cm.esp?id=135&pageid=3F00QXXSI](https://events.jpdl.com/ei/cm.esp?id=135&pageid=3F00QXXSI)

**Walking Tour of Old Montreal**

The rich cultural heritage of Old Montreal is yours to discover during this unique tour looking at the beginnings of one of North America’s oldest cities. Picturesque, handsomely preserved and vibrantly alive with Montrealers and visitors alike, Old Montreal invites you to its cobblestone streets for a glimpse at life in centuries past.

- **Price:** $40.00 (includes professional English-speaking guide, entrance fees, taxes and gratuities)
- **Recommended Attire:** Casual wear and comfortable shoes
- **Accessibility Note:** Old Montreal’s narrow streets are cobbled in places. The tour will accommodate wheelchair accessibility when required (each participant must be self-sufficient in their wheelchair to transition from streets to sidewalks).

**“Bonjour Montréal” City Tour**

Enjoy this exclusive, half-day introduction to the history and passionate culture of our cosmopolitan city.

- **Price:** $57.00 (includes professional English-speaking guide, round-trip motorcoach transportation, entrance fees, taxes and gratuities)
- **Recommended Attire:** Casual wear
- **Accessibility Note:** This is a motorcoach tour with stops. A limited number of spaces will be available for wheelchair access.

**Québec City Day Trip**

Take a step back in time to visit the only walled city in North America. See the narrow, cobbled streets, the historic buildings and unique “old world” ambience that is Québec City. Street corners and winding alleys will offer pleasant surprises at every turn.

- **Price:** $81.00 (includes professional English-speaking guide, round-trip motorcoach transportation, orientation tour of Québec City with step-on guide, taxes and gratuities)
- **Recommended Attire:** Casual wear and comfortable shoes
- **Accessibility Note:** The city of Quebec’s narrow streets and laneways are steep in places and are often cobbled. The interesting areas of this city include many hills and stairways and are not wheelchair friendly.
TRAVEL GRANTS

HEALTH PROFESSIONALS

Lily Aleksandrova (Bulgaria)
Anelya Alieva (Russian Federation)
Lorena Almeida (Brazil)
Mario Alvarez (Cuba)
Daniela Sabrina Andres (Argentina)
Hel Sio Ao (China)
David Arkadir (USA)
Anita Arsovska (Macedonia)
Josephat Asiago (Kenya)
Sabir Husain Attar (India)
Lorena Barcelos (Brazil)
Charles-Etienne Benoît (Canada)
Roberta Blundo (Italy)
Abderrahmane Chahidi (Morocco)
Alexandra Chkal (Canada)
Laura Civiero (Italy)
Amy Clements-Cortes (Canada)
David Conradsson (Sweden)
Evangelina Valeria Cores (Argentina)
Ines Cruz (Portugal)
Veronika Datieva (Russian Federation)
Matheus Augusto de Bittencourt Pasquali (Brazil)
Hanna Demissie (Ethiopia)
Tomas Diaz (Cuba)
Josefa Domingos (Portugal)
Nicole D’souza (India)
Ryan Duncan (USA)
Robert Ellis (USA)
Seyed Mohammad Fereshtehnejad (Sweden)
Roberta Filograna (Italy)
Janai Fishbein (Israel)
Veronica Francardo (Italy)
Anna Gamaley (Russian Federation)
Anamitra Ghosh (India)
Catarina Godinho (Portugal)
Jennifer Grundulis (Ireland)
Sebastian Heinzel (Germany)
Maja Herco (Bosnia)
Hanna Iderberg (Sweden)
Luis Clemente Jiménez-Botello (Mexico)
Jayasankar Kosaraju (India)
Jadwiga Kubica (Poland)
Katarzyna Kucer (Poland)
Luciano Alves Leandro (Brazil)
Sang-Min Lee (South Korea)
Michelle Lin (Singapore)
Niklas Lofgren (Sweden)
Andrea Loggini (Italy)
Roberta Marongiu (Italy)
Hector Ruben Martinez Hernandez (Mexico)
Victoria Mery (Chile)
Nicole Meyer (Canada)
Marcello Moccia (Italy)
Stephanie Morrison (Canada)
Julie Nantel (Canada)
Frouke Nijhuis (Netherlands)
Maria Nikitina (Russian Federation)
Oluwadamilola Ojo (Nigeria)
Suivadee Oravivattanakul (Thailand)
Seun Ousondlore (Nigeria)
Sanjay Pandey (India)
Maria Elisa Pimentel Piemonte (Brazil)
Luis Fernando Razzago Hernandez (Mexico)
Tanis Robinson (Canada)
Sergio Alejandro Rodriguez Quiroga (Bolivia)
Kaitlyn Roland (Canada)
Isabella Russo (France)
Anna Sauerbier (Germany)
Neha Sharma (India)
Jenny Shin (South Korea)
Hom Shrestha (Nepal)
Arun Singh (India)
Manjeet Singh (India)
Elsaveta Sokolov (United Kingdom)
Carolina Souza (Brazil)
Erin Steer (USA)
Mitali Tambe (India)
Al Huey Tan (Malaysia)
Omid Tavassoly (Iran)
Svetlana Tomic (Croatia)
Joanne Trinh (Canada)
Rebecca Twyeroold (Australia)
Martijn van Eijk (Netherlands)
Wieteke van Dijk (Netherlands)
Samuel Vidal (Brazil)
Irene SK Wong-Yu (China)
Paul Yonga (Kenya)
Daniel Ysselstein (Canada)
Jinglin Zhang (China)
Irina Zhukova (Russian Federation)

PEOPLE WITH PARKINSON’S

Sandye Acevedo (USA)
Michael Achin (USA)
Willie Arliko (Nigeria)
B. Garrison Ballenger (USA)
John Baumann (USA)
Michael Bergamo (USA)
Todd Bischoff (USA)
Celeste Bowen (USA)
Madonna Brady (Australia)
Marlin Bucherer (USA)
Mark Burek (USA)
Jane Calcott (USA)
Magnus Carlson (Sweden)
Karen Cavanaugh (USA)
Carey Christensen (USA)
Jackie Christensen (USA)
Michael Church (USA)
Cynthiia Clayton (United Kingdom)
Geoffrey Collett (United Kingdom)
Anita Connaughton (Ireland)
Charles Coury (USA)
Peggy Cowling (USA)
Rosemary Craig (Canada)
Raiyan Dan Stoian (Romania)
Anne Dowling (USA)
Irene Dvaie (Carbijk)
Sue Dubman (USA)
David Dupont (USA)
Connie Elliott (USA)
Zdislava Erbanova (Czech Republic)
Jaroslav Fridrich (Czech Republic)
Gretchen Garie-Church (USA)
Elizabeth Giesbrecht (Canada)
William J. Gleason (USA)
Gerry Halnes (USA)
Greg Halle (USA)
Linda Hinkle (USA)
Margaret Hoffmann (USA)
Helene Huddleston (USA)
Rebecca Hurd (England)
M. Irshad Jan (Pakistan)
John Kane (United Kingdom)
Terence Kavanagh (United Kingdom)
Ann Keilty (Ireland)
Kate Kelsall (USA)
Janice Kroger (USA)
Ashwani Kumar (India)
Prabhakaran Kuntly (USA)
Alice Lake (Canada)
Thomas Lamb (USA)
William (Bill) Lindsay (Australia)
Bonnie Llewellyn (Canada)
Daniel Loney (Israel)
Dwayne Low (Canada)
Gilmour (Gil) Luckham (Canada)
Peter Lule (Uganda)
Jessie Lyle (USA)
Bonnie Lyons-Cohen (Canada)
Gay Maloney (USA)
Tommy Månsson (Sweden)
Mariaelleste Martino (Italy)
Carolyn Mata (USA)
Patrick McCaughey (Northern Ireland)
Patricia McGarry (USA)
Patti Meese (USA)
Hettie Molvang (USA)
Alun Morgan (United Kingdom)
Sami Nassar (Canada)
Catherine Oas (USA)
Misae Oda (Japan)
Dianne Oliver (New Zealand)
Eric Ortiz (Puerto Rico)
Robbin Page (USA)
Dilys Parker (New Zealand)
John Pelchat (USA)
Vicky Perry (Canada)
Pamela Quinn (USA)
Allen Rabinowitz (USA)
Jey Rice (USA)
Gloria Richman (USA)
Alan Robertson (United Kingdom)
Mary Ryan (USA)
Reidar Gudmund Saunes (Norway)
Karen Scheyer (USA)
Phil Schleicher (USA)
Russ Schoumaker (USA)
Leonard Schwartz (USA)
Gandulam Sengge (Mongolia)
Gurudas Singh (India)
Paula Slinger (USA)
Allison Smith-Conway (USA)
Candace Soul (Canada)
Gregory J. Sterling (Germany)
Mark Thalacker (USA)
Rita Thomson (United Kingdom)
Viktor Tron (Hungary)
Elena Tuero (Peru)
Gary Turchin (USA)
James Van Oss (USA)
Bonnie Varian (USA)
Rogerio Vieira (Portugal)
William Wade (USA)
Renate Weigang-Sterling (Germany)
Terri Weymouth (USA)
Brynley Williams (United Kingdom)
Mary Yeaman (USA)
Benton Yip (USA)
The WPC was able to offer travel grants to researchers and clinicians because of the generous support from the Melvin Yahr International Parkinson’s Disease Foundation and the Edmond J. Safra Foundation. Travel grants were made possible to people with Parkinson’s because of the generous support from Tourism Montreal.

The WPC also enjoyed unprecedented support from delegates who offered to help sponsor OTHER delegates, both students and people with Parkinson’s, to attend the WPC via the WPC Travel Grants Program. Their donations combined helped to cover the registration fees of over 80 people.

**WPC Travel Grant Program Supporters (as of August 27, 2013)**

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- Viktor Tron
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- Fred von Zuben
- William Wilkins
- Marjie Zacks
- Paul Zimmet

**What is the Parkinson’s Buddies Program?**

The Parkinson’s Buddies Program was launched for the WPC 2013 with the support of Parkinson Society Canada and a volunteer coordinator, Bill Sloan, with the goal to match WPC registrants from within Canada to those from outside Canada. The idea was based on the concept of creating space for global dialogue, discussion and companionship across all borders and most importantly to allow delegates the chance to ‘meet’ someone before even arriving and to have a friend long after the WPC ends. Nearly 200 delegates signed up to be buddies on their own or with their partner/spouse. We would love to hear more about this program and its outcomes! Be sure to let us know if we should continue this at future Congresses!
FROM DIAGNOSIS TO DISCOVERY...

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WHAT’S TAKING SO LONG, AND WHAT CAN WE DO ABOUT IT?

JOIN THE MICHAEL J. FOX FOUNDATION FOR AN INTERACTIVE PANEL DISCUSSION

4:30 p.m. / Tuesday, October 1, 2013 / Room 516ABC

Visit us throughout the World Parkinson Congress at...

BOOTH 1211
18th INTERNATIONAL CONGRESS OF PARKINSON'S DISEASE AND MOVEMENT DISORDERS

2014 Important Dates
October 1, 2013  Abstract Submission Opens
December 2, 2013  Registration Opens
January 6, 2014  Abstract Submission Closes
April 11, 2014  Early Registration Deadline
May 9, 2014  Final Pre-registration Deadline
June 8-12, 2014  18th International Congress of Parkinson’s Disease and Movement Disorders

SAVE THE DATE
**TUESDAY OCT 1**

- **7:00 AM**
  - Opening Ceremony

- **7:30 AM**
  - Welcome Reception

- **8:00 AM**
  - Exhibition

- **8:30 AM**
  - Pre-congress Course I: Fundamentals of PD

- **9:00 AM**
  - Pre-congress Course II: Interdisciplinary Care & Parkinson’s Disease

- **9:30 AM**
  - Pre-congress Course III: Science & Advocacy

- **10:00 AM**
  - Renewal Room

- **10:30 AM**
  - Performance & Film Room

- **11:00 AM**
  - Special Lecture

- **11:30 AM**
  - Tours

- **12:00 PM**
  - Lunch/Poster Presentation

- **12:30 PM**
  - Parallel Sessions

- **1:00 PM**
  - Workshops

- **1:30 PM**
  - Roundtables

- **2:00 PM**
  - French Track

- **2:30 PM**
  - Parallel Sessions

- **3:00 PM**
  - Workshops

- **3:30 PM**
  - French Track

- **4:00 PM**
  - Parallel Sessions

- **4:30 PM**
  - Workshops

- **5:00 PM**
  - French Track

- **5:30 PM**
  - Parallel Sessions

- **6:00 PM**
  - French Track

- **6:30 PM**
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- **9:00 PM**
  - French Track

- **9:30 PM**
  - French Track

**WEDNESDAY OCT 2**

- **7:00 AM**
  - Hot Topics

- **7:30 AM**
  - Morning Plenary

- **8:00 AM**
  - Parallel Sessions

- **8:30 AM**
  - Workshops

- **9:00 AM**
  - Roundtables

- **9:30 AM**
  - French Track

- **10:00 AM**
  - Parallel Sessions

- **10:30 AM**
  - French Track

- **11:00 AM**
  - Parallel Sessions

- **11:30 AM**
  - French Track

- **12:00 PM**
  - Parallel Sessions

- **12:30 PM**
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  - French Track

- **9:30 PM**
  - French Track

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*The parallel sessions in room 517A will also be webcast.*
**PROGRAM OVERVIEW**

**CONGRESS**

Speakers will give an overview of the assigned topic then work together presenting case studies or research that can highlight the topic in ways that are educational, unique and easy to digest. These sessions are designed to allow for more discourse and longer question and answer periods.

**PRE-Congress Courses**

Taking place on Tuesday, October 1, these three day-long courses for those interested in specific topics include a ‘Fundamental of PD’ course for those who need a crash course on Parkinson’s, an ‘Interdisciplinary Health Care’ course for those interested in interdisciplinary models of care, how they work, the challenges of setting them up, and what outcomes have shown once they are implemented; and a “Science & Advocacy” course where our sponsors present a variety of sessions covering ongoing scientific research and promising studies as well as advocacy and increasing clinical trial awareness and engagements.

**HOT TOPICS**

Each morning, just before the opening plenary, four of the hottest topics from the poster abstracts will be presented to the broader audience. Presentations are given orally in the categories of: basic science, clinical science, clinical therapeutics, and complementary care. Presenters will introduce cutting edge work that adds great value to the community.

**PLENARY SESSIONS**

Designed to bring together all Congress attendees each morning, plenary sessions offer presentations on specific topics to highlight the daily themes, starting with Day One: Why and how specific neurons die in Parkinson’s disease and what can be done about it; Day Two: Non-motor manifestations of Parkinson’s disease; and Day Three: New views on the management of Parkinson’s disease. The plenaries are held in the same room each morning, starting just after the Hot Topics presentations. Plenaries offer limited questions and answer periods, but experts will be available in workshops or round tables later each day to continue discussing the topics in more detail.

**PARALLEL SESSIONS**

Designed to offer in-depth sessions focused on specific cutting-edge research in the field of Parkinson’s, these sessions are directed to those who want to understand the basic and clinical science underlying the research conducted to better comprehend the many facets of Parkinson’s disease. These sessions are set in lecture halls of up to 500 delegates and offer question and answer periods, but with less interactivity than workshops.

**Workshops**

23 different workshops designed for smaller groups of attendees ranging from 75 to 150 people are being offered. Speakers will give an overview of the assigned topic then work together presenting case studies or research that can highlight the topic in ways that are educational, unique and easy to digest. These sessions are designed to allow for more discourse and longer question and answer periods.

**Roundtable**

Also known as “Meet the Experts”, these specially designed Roundtable sessions allow for delegates to sit down with an expert on a wide range of fields in a very small, intimate group setting, to get to the nitty-gritty with questions about the topics. Experts will give a short oral overview of the predetermined topic and will then take questions by the guests. (Free, sign up required. Space is LIMITED.)

**Special Lectures**

These special sessions are designed to highlight one topic each day, starting with the history of James Parkinson, the history of Parkinson’s science and research in Canada, and to close on the final day, a special lecture from a few people living with Parkinson’s on how they living positively with the disease.

**French Track/Sessions en Francais**

Targeted to an audience of French speakers who live with Parkinson’s or others with little to no scientific experience, these daily sessions, two each afternoon, will expose participants to key topics in clinical and basic science research in Parkinson’s and will explain why research in these areas may lead to a better understanding of Parkinson’s, its diagnosis and treatment. All sessions in French only.

**Wrap-Up**

Designed to bring together all Congress attendees at the end of the day, Daily Wrap-up sessions are a summary of the key learnings each day. Presentations are delivered by some of the leaders in the field who will have the tough task of preparing these talks each day. This is a great way to catch some key topics you missed while attending other sessions and to hear from these leaders what they are taking away from the sessions they participated in.

*The parallel sessions in room 517A will also be webcast.*
COURSE I: Fundamentals of PD

Room: 517D

Target Audience: Non-clinicians, people with Parkinson’s, others.

Goal: Expose participants to key topics that will be elaborated on in the program. Give them a glimpse of what is to come and tools to get the most out of the meeting. Introduce the role of PwPs into the meeting design and success as well as the legacy of the WPC.

Learning Objectives:
1. To gain a basic understanding of Parkinson’s, including the research into the cause(s) of the disease, symptoms, and therapies;
2. To learn the spectrum of care and rehabilitation options once diagnosed with Parkinson’s;
3. To understand future therapies for Parkinson’s.

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
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</thead>
<tbody>
<tr>
<td>9:15 AM</td>
<td>Introduction</td>
<td>Tom Isaacs (UK)</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>What is PD?</td>
<td>Stanley Fahn (USA)</td>
</tr>
<tr>
<td>9:45 AM</td>
<td>Pathology of PD</td>
<td>Dennis Dickson (USA)</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>What causes PD?</td>
<td>Marie-Francoise Chesselet (USA)</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>Q &amp; A Panel</td>
<td>Facilitator: David Iverson (USA)</td>
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<tr>
<td>10:30 AM</td>
<td>BREAK</td>
<td></td>
</tr>
<tr>
<td>11:00 AM</td>
<td>Non-motor features</td>
<td>Ronald Pfeiffer (USA)</td>
</tr>
<tr>
<td>11:15 AM</td>
<td>Medical therapy</td>
<td>Christopher Goetz (USA)</td>
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<tr>
<td>11:30 AM</td>
<td>Surgical therapy</td>
<td>Andres Lozano (Canada)</td>
</tr>
<tr>
<td>11:45 AM</td>
<td>Q &amp; A Panel</td>
<td>Facilitator: David Iverson (USA)</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>LUNCH</td>
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</tr>
<tr>
<td>1:15 PM</td>
<td>What you can do after you are diagnosed to stay involved</td>
<td>Peter Davison (Canada)</td>
</tr>
<tr>
<td>1:30 PM</td>
<td>Therapeutic options to stay active and involved</td>
<td>Bonnie Bereskin (Canada)</td>
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<tr>
<td></td>
<td>- Speech and Parkinson’s</td>
<td>Terry Ellis (USA)</td>
</tr>
<tr>
<td></td>
<td>- Physical therapy and Parkinson’s</td>
<td>Margarita Makoutonina (Australia)</td>
</tr>
<tr>
<td>2:15 PM</td>
<td>Q &amp; A Panel</td>
<td>Facilitator: Linda Morgan (USA)</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>BREAK</td>
<td></td>
</tr>
<tr>
<td>3:00 PM</td>
<td>Future therapies</td>
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<td></td>
<td>- Stem cells</td>
<td>Patrik Brundin (USA)</td>
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<tr>
<td></td>
<td>- Viral vectors and gene therapy</td>
<td>Jeffrey Kordower (USA)</td>
</tr>
<tr>
<td></td>
<td>- Drug treatments</td>
<td>Ollivier Rascol (France)</td>
</tr>
<tr>
<td>3:50 PM</td>
<td>Q &amp; A Panel</td>
<td>Facilitator: Linda Morgan (USA)</td>
</tr>
<tr>
<td>3:55 PM</td>
<td>Getting the most out of the WPC 2013</td>
<td>Bob Kuhn (Canada)</td>
</tr>
<tr>
<td>4:05 PM</td>
<td>Wrap-up</td>
<td>Bob Kuhn (Canada) and</td>
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<tr>
<td></td>
<td></td>
<td>Stanley Fahn (USA)</td>
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<tr>
<td>6:30 PM</td>
<td>Opening Ceremony (Room 517ABC)</td>
<td></td>
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<tr>
<td>7:30 PM</td>
<td>Welcome Reception (Exhibit Hall room 220CDE)</td>
<td></td>
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</tbody>
</table>

Course made possible with support from The Movement Disorder Society and Novartis.
## COURSE II: Interdisciplinary Care & Parkinson’s Disease

**Room: 518ABC**

**Target Audience:** Allied health professionals, members of multidisciplinary teams, health professionals interested in interdisciplinary care models.

**Goal:** The aim of this pre-congress course is to provide a forum for discussion of service delivery models in PD. Current model types will be presented for the purpose of discussion and will be referenced to a template of current service delivery components. The ideal model should focus on the complexity of PD, the need to provide continuity of care and be able to deal with the cumulative morbidities associated with a chronic illness.

**Learning Objectives:**
1. Understand the complexity of PD and its underlying pathological basis;
2. Be aware of the wide variety of factors that need to be considered in providing comprehensive and continuous care;
3. Be able to advise on the development, modification or redesign of a service model for PD taking into consideration the organizational infrastructure of the delegate’s institution.

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM</td>
<td>Introduction</td>
<td>Anne-Louise Lafontaine (Canada)</td>
</tr>
<tr>
<td>9:10 AM</td>
<td><strong>What do we face?</strong></td>
<td>Bastiaan Bloem (Netherlands)</td>
</tr>
<tr>
<td>9:40 AM</td>
<td><strong>How is it addressed? &amp; Overview of available delivery options &amp; models currently in use</strong></td>
<td>Ruth Hagestuen (USA)</td>
</tr>
<tr>
<td>10:10 AM</td>
<td><strong>What this all means for people with Parkinson’s</strong></td>
<td>Alice Templin (Canada)</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>BREAK</strong></td>
<td></td>
</tr>
<tr>
<td>11:00 AM</td>
<td><strong>Introduction: The role of the multidisciplinary team: Evidence that shows it’s working and what UNIQUE contribution these people make to the team</strong></td>
<td>Mark Guttmann (Canada)</td>
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</tbody>
</table>

**PANELISTS**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:20 AM</td>
<td>General practitioner’s role</td>
<td>Christiane Lepage (Canada)</td>
</tr>
<tr>
<td>11:40 AM</td>
<td>Geriatrician’s role</td>
<td>Peter Fletcher (UK)</td>
</tr>
<tr>
<td>12:00 AM</td>
<td>Nurse’s role</td>
<td>Lucie Lachance (Canada)</td>
</tr>
<tr>
<td>12:20 AM</td>
<td>Rehabilitation scientist’s role</td>
<td>Terry Ellis (USA)</td>
</tr>
<tr>
<td>12:40 PM</td>
<td>Q &amp; A</td>
<td></td>
</tr>
<tr>
<td>1:10 PM</td>
<td><strong>LUNCH</strong></td>
<td></td>
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<tr>
<td>2:10 PM</td>
<td><strong>PANEL – Multidisciplinary teams [20-minute talk + Q&amp;A immediately following talk] Introduction:</strong> Peter Fletcher (UK)</td>
<td>How are these approaches and models different? What strengths do they offer or weakness do they create? How does each of these models solve the problem of an individualized approach to care? Or do they?</td>
</tr>
<tr>
<td>2:15 PM</td>
<td>Israeli Model – Tel Aviv</td>
<td>Nir Giladi (Israel)</td>
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<tr>
<td>2:45 PM</td>
<td>Netherlands Model – ParkinsonNet</td>
<td>Marten Munneke (Netherlands)</td>
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<tr>
<td>3:15 PM</td>
<td>US Model – Struthers Center</td>
<td>Ruth Hagestuen (USA)</td>
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<tr>
<td>3:45 PM</td>
<td>TBD</td>
<td></td>
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<tr>
<td>4:15 PM</td>
<td>Canadian Model – McGill Movement Disorders Clinic</td>
<td>Anne-Louise Lafontaine (Canada)</td>
</tr>
<tr>
<td>4:45 PM</td>
<td>Q &amp; A from ALL panelists &amp; audience</td>
<td>Bastiaan Bloem (Netherlands) and Peter Fletcher (UK)</td>
</tr>
<tr>
<td>5:10 PM</td>
<td><strong>Wrap-up</strong></td>
<td>Alice Templin (Canada) and Nir Giladi (Israel)</td>
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<tr>
<td>6:30 PM</td>
<td>Opening Ceremony (Room 517ABC)</td>
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<tr>
<td>7:30 PM</td>
<td>Welcome Reception (Exhibit Hall room 220CDE)</td>
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</table>
COURSE III: Science & Advocacy
Room: 516ABCD

Target Audience: These will be crosstalk sessions appropriate for a mix of the community, including clinicians, researchers, people with Parkinson’s and others.

Goal: Expose participants to unique research being carried out, advocacy programs being run and others issues related to advancing the understanding of Parkinson’s science and increasing involvement of people living with Parkinson’s in the process.

8:30 AM
Panel on new science and ongoing research: What’s in the pipeline?
- Talk #1: Enhancing norepinephrine neurotransmission as a promising therapeutic target
  - Moderator: Rajesh Pahwa (USA)
  - Peter LeWitt (USA)
- Talk #2: Novel levodopa deliveries: Part I
  - Moderator: Rajesh Pahwa (USA)
- Talk #3: Novel levodopa deliveries: Part II
  - Moderator: Leonard Verhagen (USA)
- Talk #4: Natural products in the development of new therapies
  - Moderator: H.A. Robertson (Canada)

Learning Objectives:
1. To understand newer forms of levodopa preparations to reduce off time;
2. Understand products related to improving orthostatic hypotensive symptoms;
3. Use of natural products in developing new therapies.

Supported through unrestricted educational grants from Chelsea Therapeutics, Impax Pharmaceuticals, Neurodyne, and Depomed, Inc.

10:00 AM BREAK

10:30 AM
Role of imaging in diagnosis and as a window into progression and pathogenesis of Parkinson’s disease?
- Talk #1: Imaging Approaches
  - Moderator: Oksana Suchowersky (Canada)
  - Nicola Pavese (UK)
- Talk #2: Clinical Implications of Imaging
  - Moderator: Ken Marek (USA)

Learning Objectives:
1. To understand the role imaging plays in diagnosis of Parkinson’s;
2. Be able to explain how imaging is used to follow progression of Parkinson’s;
3. Understand how imaging is used to study the pathogenesis of Parkinson’s.

Supported through an unrestricted educational grant from GE Healthcare

11:45 AM Role of Deep Brain Stimulation in Management of Parkinson’s Disease
- Talk #1: Rationale and clinical outcomes of DBS in patients with advanced PD
  - Moderator: Joseph Jankovic (USA)
  - Michael Okun (USA)
- Talk #2: DBS for early fluctuating disease and controversial indications
  - Moderator: Günther Deuschl (Germany)

Learning Objectives:
1. To understand the rationale and patient selection for DBS;
2. To learn about the benefits and the risks of DBS;
3. To interpret data from trials of clinical outcomes of DBS.

Supported through an unrestricted educational grant from Medtronic

12:45 PM LUNCH

1:45 PM Attempts to obtain neuroprotection in PD
- Talk #1: Status of current therapies
  - Moderator: C. Warren Olanow (USA)
  - Fabrizio Stocchi (Italy)
- Talk #2: Novel targets and candidate approaches
  - Moderator: Patrik Brundin (USA)
- Talk #3: Obstacles to developing a neuroprotective therapy

Learning Objectives:
1. To understand current unmet needs;
2. To be able to define targets for putative neuroprotective therapies;
3. To appreciate the obstacles that must be overcome in order to develop a neuroprotective therapy.

Supported through an unrestricted educational grant from Teva Pharmaceuticals

3:00 PM BREAK
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
</table>
| 3:30 PM| **Patient Engagement in Research – The Next Blockbuster Drug?**       | **Topic:** This interactive panel will focus on the new and emerging role of patients as partners in research and health care decision-making through a dialogue among researchers and patients who have initiated models of patient engagement in Parkinson’s as well other disease areas.  
**Panelists:** Diane Cook (USA), Michael Schwarzschild (USA), Stephen Samis (Canada)  
**Learning Objectives:**  
1. To learn about the ongoing efforts of community members to engage people with Parkinson’s in the clinical trial process and advance research advocacy.  
2. Gain an understanding of what patient engagement is, its role in research and health care decision-making as well ad model for patient engagement and outcomes;  
3. Learning about the potential of patient engagement to accelerate therapies and improve health outcomes.  
Supported through an unrestricted educational grant from Parkinson’s Disease Foundation  
**WPC Disclaimer:** This session was organized by the Parkinson’s Disease Foundation. The program was approved by the WPC, but topics and opinions do not necessarily reflect that of the WPC Inc. |
| 4:45 PM| **What’s taking so long, and what can we do about it?**               | **Topic:** An interactive panel discussion about the most difficult challenges facing Parkinson’s research today, strategies and progress to address them, and how the community can take action to speed a cure.  
**Panelists:** David Burn (UK), Soania Mathur (Canada), Todd Sherer (USA), David Standaert (USA) and David Weiner (USA)  
**Learning Objectives:**  
1. Develop familiarity with the biggest challenges faced in Parkinson’s research today;  
2. Gain an understanding of strategies – and progress – in addressing these challenges in order to get to new therapies and a cure;  
3. Learn about the role patients and their loved ones can – and need – to play in clinical research to speed a cure in our lifetime.  
Supported through an unrestricted educational grant from The Michael J. Fox Foundation for Parkinson’s Research  
**WPC Disclaimer:** This session was organized by the Michael J. Fox Foundation. The program was approved by the WPC, but topics and opinions do not necessarily reflect that of the WPC Inc. |
| 6:30 PM| **Opening Ceremony (Room 517ABC)**                                    |                                                                                                                                          |
| 7:30 PM| **Welcome Reception (Exhibit Hall room 220CDE)**                      |                                                                                                                                          |
**HOT TOPICS – 8:00 AM to 9:00 AM**

**Room: 517AB**

**Moderator:** Thomas Gasser (Germany)

**Michelle Lin (Canada)**  
P01.14 Exome sequencing of Norwegian families with PD reveals novel gene mutations

**Alexandru Hanganu (Canada)**  
P15.09 Mild Cognitive Impairment in Parkinson’s disease is linked with extensive cortical thinning during longitudinal analysis

**Maryka Quik (USA)**  
P23.02 Nicotine and nicotinic receptor drugs reduce L-dopa-induced dyskinesias in a nonhuman primate model of Parkinson’s disease

**Ryan Duncan (USA)**  
P22.20 Balance differences between people with and without freezing of gait in Parkinson disease

Session supported by an unrestricted educational grant from Impax Pharmaceuticals

**PLENARY SESSION – 9:10 AM to 11:10 AM**

**Why and how specific neurons die in Parkinson’s disease and what can be done about it**


**Learning Objectives:**
1. To learn about new mechanisms of neurodegeneration of PD;
2. To understand the multifaceted nature of the neurodegenerative process in PD;
3. To acquire knowledge as to how basic science may help in treatment for PD.

**Chair:** Thomas Gasser (Germany)  
**Co-chair:** Jon Stamford (UK)

**Lecture 1:** Propagation of the neurodegenerative process in PD and the Prion-like hypothesis  
*Speaker:* Virginia Lee (USA)

**Lecture 2:** Can the interaction between genetics, environment, and behavior be a key determinant of PD expression  
*Speaker:* Christine Klein (Germany)

**Lecture 3:** What epidemiological and preclinical studies teach us about inflammation and PD  
*Speaker:* Etienne Hirsch (France)

**Lecture 4:** Developing new treatments founded on the basic science of PD  
*Speaker:* Patrik Brundin (USA)

**LE GRAND CONTINENTAL** A special dance performance  
—— 11:30 AM to 11:45 AM

**Viger Hall**

**SPECIAL LECTURE – 11:45 AM to 1:15 PM**

**Room: 517D – [SLL-W]**

**Introduction by:** Stanley Fahn (USA)

**Special Lecture:** The Glory of Canadian Sciences and Parkinson’s Disease  
*Speaker:* Rémi Quirion (Canada)

**Special Lecture:** The Life and Times of James Parkinson  
*Speaker:* Gerald Stern (UK)
Parallel Session: New genes and risk factors of PD
Room: 517A – [PA-W1] – Level of talks: Moderately scientific

Learning Objectives:
1. To learn about new dominant and recessive high-penetrance PD genes as well as the newly discovered rare variants with moderate effect and their implication for the understanding of the biology of neurodegeneration in PD;
2. To learn about the role of common genetic risk-factors identified through GWAS, and their biological effects;
3. To learn about the latest developments that goes beyond pure genetic analysis and takes into account environmental factors, epigenetic modifications and clinical endophenotypes.

Chair: Christine Klein (Germany)
Co-chair: Matthew Farre (Canada)

Lecture 1: New PD genes and rare variants  
Speaker: Matthew Farre (Canada)

Lecture 2: Risk factors for sporadic PD  
Speaker: Andrew Singleton (USA)

Lecture 3: Genetics and gene environment interactions  
Speaker: Haydeh Payami (USA)

Parallel Session: Protein misfolding as a key pathogenic event

Learning Objectives:
1. To learn about the notion of protein folding and its role in pathological situations;
2. To understand the importance of the mechanisms responsible for the maintenance of the wellbeing of proteins;
3. To acquire knowledge about the link between defects in the lysosomal function and neurodegeneration.

Chair: Virginia Lee (USA)
Co-chair: Leonidas Stefanis (Greece)

Lecture 1: Alpha-synuclein conformation and neurodegeneration  
Speaker: Leonidas Stefanis (Greece)

Lecture 2: Protein misfolding in neurodegenerative diseases  
Speaker: Leonard Petrucelli (USA)

Lecture 3: Link between lysosomal function and neurodegeneration in PD  
Speaker: Dimitri Krainc (USA)

Parallel Session: Role of functional imaging modalities in the diagnosis and management of PD
Room: 517D – [PA-W3] – Level of talks: Crosstalk

Learning Objectives:
1. Learn about new advances in structural magnetic resonance (MR) imaging applied to PD, possible roles for diagnosis, differential diagnosis and biomarker;
2. Learn about neurochemical imaging using either PET or SPECT, role in diagnosis and as a biomarker to detect preclinical disease and measure disease progression;
3. Learn how studies of cerebral connectivity (fMRI, PET, DTI) can enhance our understanding of PD and of brain function.

Chair: Jon Stoessl (Canada)
Co-chair: David Eidelberg (USA)

Lecture 1: Structural imaging for PD: MRI and transcranial sonography (TCS)  
Speaker: Klaus Seppi (Austria)

Lecture 2: Neurochemical imaging  
Speaker: Nicola Pavese (UK)

Lecture 3: Functional connectivity  
Speaker: David Eidelberg (USA)
Program - Wednesday, October 2, 2013

Parallel Session: Non-dopaminergic systems in PD: Anatomy, Biochemistry, and Pathology

Learning Objectives:
1. Understand how impairment in serotonin neuron function impacts the development of non-motor symptoms in PD;
2. Able to describe how cholinergic neuron dysfunction impacts the development of non-motor symptoms in PD and related disorders;
3. Explain the role of glutamatergic and serotonergic neurotransmission for the development of L-DOPA induced dyskinesias.

Chair: Jeffrey Kordower (USA)
Co-chair: Abdelhamid Benazzouz (France)

Lecture 1: Role of noradrenaline and serotonin systems for the development of non-motor symptoms
Speaker: Abdelhamid Benazzouz (France)

Lecture 2: Impact of cholinergic dysfunction on the development of non-motor symptoms
Speaker: Nicolaas Bohnen (USA)

Lecture 3: Role of non-dopaminergic systems in the development of L-DOPA-induced dyskinesias
Speaker: Angela Cenci (Sweden)

Workshops – 1:30 PM to 3:00 PM

Workshop: Why supporting research is crucial: from government to private funding agencies
Room: 513DEF – [WS-W1] – Level of talks: Crosstalk

Learning Objectives:
1. To understand the value of basic research in understanding causes of and finding treatments for PD;
2. To recognize the complementary roles of governmental agencies and non-governmental organizations in supporting basic research;
3. To provide examples of how the Parkinson’s community can effectively advocate for research funding.

Introduction: Tom Isaacs (UK)
Panelists: Etienne Hirsch (France), Remi Quirion (Canada), Todd Sherer (USA) and Amy Comstock Rick (USA)

Workshop: Mitochondrial defect in PD: myth or reality?

Learning Objectives:
1. To learn about mitochondrial biology;
2. To understand the key issues that surrounds the question of mitochondrial defect in PD;
3. To participate in a discussion about whether or not at this point there are sound experimental elements to implicate a mitochondrial defect in PD pathogenesis.

Overview: Mitochondria: a multifunctional organelle
Speaker: Carolyn Sue (Australia)

Case Presentations: The status of mitochondria in PD
Panelists: Carolyn Sue (Australia), Luca Scorrano (Switzerland) and Miquel Vila (Spain)

Workshop: Sexual issues in Parkinson’s disease: assessment and intervention
Room: 512EF – [WS-W3] – Level of talks: Crosstalk

Learning Objectives:
1. Describe the variety of sexual disorders among patients with Parkinson’s disease;
2. Appreciate the range of therapeutic interventions for the various sexual disorders in Parkinson’s disease;
3. Understand that having Parkinson’s disease and being intimate are not mutually exclusive.

Overview: Sexual challenges in Parkinson’s and therapeutic options
Speaker: Paul Rabstyn (Netherlands)

Case Presentations: Panelists: Gila Bronner (Israel) and Paul Rabstyn (Netherlands)

Workshop: Quality of life and comfort in the late stages of Parkinson’s disease

Learning Objectives:
1. Explore the symptoms of late stage and end stage Parkinson’s;
2. Understand the medical, ethical and legal issues;
3. Learn about the Palliative Care model, helpful in maintaining comfort for patient/family.

Overview: Issues and choices in late stage Parkinson’s
Speaker: Janis Miyasaki (Canada)

Case Presentations: Panelists: Lisa Mann (USA) and Janis Miyasaki (Canada)
**FRENCH TRACK — 1:30 PM to 3:00 PM**

**French Track:** (See full track on page 45)

**Room: 518ABC — [FRE-W1] — Level of talks: Crosstalk in French**

**Chair:** Serge Przedborski (USA)

**Lecture 1:** Is there a functional defect with mitochondrial in Parkinson’s disease?
*Speaker:* Celine Perier (Spain)

**Lecture 2:** Clinical Trials: Present challenges and emerging breakthroughs
*Speaker:* Olivier Rascol (France)

**PARALLEL SESSIONS II — 3:30 PM to 5:00 PM**

**Parallel Session:** Quality of life in Parkinson’s disease: several important determinants

**Room: 517D — [PA-W5] — Level of talks: Crosstalk**

**Learning Objectives:**
1. Define obstacles people face after diagnosis through the continuum of the disease;
2. Understand practical solutions and methods of achieving overall quality of life;
3. Understand the power of engagement and advocacy in dealing with psychological challenges of PD.

**Chair:** Alessandro DiRocco (USA)

**Co-chair:** Peter Fletcher (UK)

**Lecture 1:** Practical solutions to driving, early job loss, and relationship issues
*Speaker:* Peter Fletcher (UK)

**Lecture 2:** Psychological solutions to dealing with pity, dignity, sense of worth and communication
*Speaker:* Diane Cook (USA)

**Lecture 3:** Physical solutions to coping with pain, motor/non-motor, cognition, mood, and behaviour
*Speaker:* Soania Mathur (Canada)

**Parallel Session:** How Parkinson’s affects attention and memory

**Room: 517A — [PA-W6] — Level of talks: Crosstalk**

**Learning Objectives:**
1. Describe the clinical features, syndromes, and proposed mechanisms of cognitive dysfunction in Parkinson’s disease;
2. List and contrast the various approaches for evaluating and monitoring the progression and treatment of cognitive dysfunction in Parkinson’s disease, including assessments that can take place during a clinical interview, using bedside screening tools, and in performance-based tests;
3. Initiate practical strategies for management of cognitive deficits in Parkinson’s disease.

**Chair:** Alexander Tröster (USA)

**Co-chair:** Connie Marras (Canada)

**Lecture 1:** Memory and attention issues in Parkinson’s disease—clinical characteristics and mechanisms
*Speaker:* David Burn (UK)

**Lecture 2:** Clinical Assessment of Cognition in PD
*Speaker:* Connie Marras (Canada)

**Lecture 3:** Practical management of cognitive deficits in Parkinson’s disease; what can occupational therapists offer?
*Speaker:* Margarita Makoutonina (Australia)

**Parallel Session:** Experimental models of non-motor manifestations of PD

**Room: 516ABC — [PA-W7] — Level of talks: Moderately scientific**

**Learning Objectives:**
1. Describe animal models of non-motor manifestation in Parkinson’s disease;
2. Compare the non-motor symptoms in Parkinson’s disease and animal models;
3. Identify the neuronal network involved in the genesis of non-motor symptoms in Parkinson’s disease.

**Chair:** Beth-Anne Sieber (USA)

**Co-chair:** Ingrid Philippens (Netherlands)

**Lecture 1:** Animal models of hyper dopaminergic behavior in Parkinson’s disease
*Speaker:* Christelle Baunez (France)

**Lecture 2:** Animal models of sleep disorders in Parkinson’s disease
*Speaker:* Ingrid H Philippens (Netherlands)

**Lecture 3:** Animal models of gastrointestinal dysfunction in Parkinson’s disease
*Speaker:* Marie-Francoise Chesselet (USA)

**Session Levels**
- Minimal or no scientific background required for these sessions
- Moderate-level scientific sessions
- High-level scientific sessions
Parallel Session: Optogenetic tools to study PD pathophysiology  
Room: 517C – [PA-W8] – Level of talks: Highly scientific

Learning Objectives:
1. To understand the power and use of Optical Neural Engineering to probe neural function;
2. To describe how neural activity shapes motor behaviour;
3. To be able to discuss how neural activity controls motor behaviour.

Chair: Ted Dawson (USA)  
Co-chair: Antoine Adamantidis (Canada)  

Lecture 1: Optical Neural Engineering  
Speaker: Antoine Adamantidis (Canada)  

Lecture 2: Regulation of Parkinsonian motor behaviors by optogenetic control of basal ganglia circuitry  
Speaker: Anatol Kreitzer (USA)  

Lecture 3: Optical Interrogation of the dopaminergic systems  
Speaker: Antonello Bonci (USA)

Workshops – 3:30 PM to 5:00 PM

Workshop: Everything you always wanted to know about genetics and that you never dared to ask  

Learning Objectives:
1. To understand the basic principles of Mendelian genetics;
2. To learn about the genetic contribution to Parkinson’s disease;
3. To recognize the familial significance of genetics on Parkinsonisms.

Overview: What is genetics?  
Speaker: Carolyn Sue (Australia)  

Case Presentations: Panelists: Susan Bressman (USA), Carolyn Sue (Australia), Matthew Farrer (USA) and Andrew Singleton (USA)  

Workshop: How researchers and people with Parkinson’s can advance clinical trials together  

Learning Objectives:
1. To learn about opportunities where people with Parkinson’s can learn about and be trained as clinical research advocates;
2. To understand the key issues that people with Parkinson’s should be aware of and questions they should be asking when evaluating a clinical trial and where or not to participate;
3. To understand that there are steps people with Parkinson’s can take to influence and improve the clinical trial process.

Overview: Challenges and positive outcomes of including people with Parkinson’s in the research process and the need for an international collaboration.  
Speaker: Linda Morgan (USA)  

Panel Discussion: Panelists: Steve DeWitte (USA), Tom Isaacs (UK) and Linda Morgan (USA)

Workshop: How drugs make it to your cabinet  

Learning Objectives:
1. Understand the process of drug discovery and resources needed to bring drugs to patients’ cabinets
2. Understand translational research (from the bench to the bedside);
3. Be able to explain the pre-clinical and clinical phases of drugs and the important role of the Parkinson community in pushing these phases forward.

Overview: Innovations in neuroscience technologies as they apply to finding target molecules to the point of pre-clinical studies  
Speaker: Howard Federoff (USA)  

Panel Discussion: Panelists: Marc Brinkman (Germany) and Howard Federoff (USA)
**Workshop:** Music, creativity and Parkinson’s  
**Room:** 512GH – [WS-W8] – Level of talks: Crosstalk

**Learning Objectives:**
1. To understand how people with Parkinson’s have integrated high-quality performing and visual arts into their Parkinson’s outreach and support programs;
2. To explore effective common Best Practices in singing and musical work that have worked particularly well in engaging persons with PD, care partners and families;
3. Understand methods and barriers to building music-based programs.

**Overview:** Music, Creativity and Parkinson’s  
**Speaker:** Steven Frucht (USA)

**Panel Discussion:** Panelists: Steven Frucht (USA), Margaret Mullaney (Ireland) and David Simmonds (Canada)

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**French Track - 3:30 PM to 5:00 PM**

**French Track:** (See full track on page 45)  
**Room:** 518ABC – [FRE-W1] – Level of talks: Crosstalk in French

**Chair:** David Lussier (Canada)

**Lecture 1:** Is there a role for gene- and cell-based therapies in the treatment of Parkinson disease?  
**Speaker:** Stephane Palfi (France)

**Lecture 2:** Sleep, fatigue, and apathy in Parkinson’s disease  
**Speaker:** Nico Diederich (Luxembourg)

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**Roundtable - 3:30 PM to 5:00 PM**

**Roundtable:** Meet the Experts  
**Room:** 511C – [RT-W] – Level of talks: Crosstalk

**Note:** Seats at tables are limited. Ticket required.

**Table 1:** Speech Pathology and Parkinson’s  
**Host:** Lorraine Ramig (USA)

**Table 2:** Physical therapy and Parkinson’s - can it really help?  
**Host:** Terry Ellis (USA)

**Table 3:** Blogging and Parkinson’s: How people with Parkinson’s can educate and raise awareness via blogging  
**Co-hosts:** Bob Kuhn (Canada) & Jean Burns (USA)

**Table 4:** What to Ask Before Joining a Clinical Trial: PwP to PwP  
**Co-hosts:** Jon Stamford (UK) & Israel Robledo (USA)

**Table 5:** Young Onset Parkinson’s: Unique Challenges  
**Host:** Peter Davison (Canada)

**Table 6:** Psychiatric Changes in Parkinson’s Disease  
**Host:** Laura Marsh (USA)

**Table 7:** Sex & Parkinson’s disease  
**Host:** Gila Bronner (Israel)

**Table 8:** What’s in the pipeline for new delivery systems for Parkinson’s?  
**Host:** Angelo Antonini (Italy)

**Table 9:** Facing your fear: Rising to the Challenge  
**Host:** Alex Flynn (UK) & Daniel Weintraub (USA)

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**Wrap-Up - 5:15 PM to 6:30 PM**

**Room:** 517D

**Facilitator:** David Iverson (USA)

**Panelists:** Ted Dawson (USA), Andres Lozano (Canada), Jeffrey Kordower (USA), Mark Guttman (Canada), Susan Fox (Canada)
Day 2 — Thursday, October 3, 2013

Non-motor manifestations of Parkinson’s disease
Room: 517AB – [PL-T] – Level of talks: Crosstalk

Learning Objectives:
1. Better understand the diversity of non-motor symptoms that can be present in PD and analyze their clinical features;
2. Recognize the role of imaging studies in the assessment and understanding of non-motor manifestations of PD;
3. Be able to describe how co-existent medical conditions or co-morbidities may have an impact on the clinical features and the progression of PD.

Chair: Oscar Gershanik (Argentina)
Co-chair: Sharon Daborn (Australia)

Lecture 1: The spectrum of non-motor symptoms in PD
Speaker: Ray Chaudhuri (UK)

Lecture 2: Dementia and psychiatric manifestations in PD
Speaker: David Burn (UK)

Lecture 3: Contribution of functional neuroimaging to the understanding of non-motor manifestations of PD
Speaker: Antonio Strafella (Canada)

Lecture 4: The impact of other medical conditions on the course of PD
Speaker: Janis Miyasaki (Canada)

Special Lecture — 11:45 AM to 1:15 PM
Room: 517D – [SLL-T]

Introduction by: A. Jon Stoessl (Canada)

Inaugural WPC James Parkinson Lecture
Past, Present and Future of Parkinson Disease
Speaker: C. Warren Olanow (USA)
Parallel Session: PD or not PD – that is the question: Is it time to redefine/reclassify Parkinson’s disease?
Room: 517A – [PA-T1] – Level of talks: Crosstalk

Learning Objectives:
1. Discuss the current definitions and diagnostic criteria for PD and the reasons for redefining the disorder;
2. Discuss ‘prodromal’ Parkinson’s disease and monogenetic Parkinson’s disease and how these challenge approaches to classification and diagnosis;
3. Discuss considerations and challenges to establishing new diagnostic criteria for PD.

Chair: Christopher Goetz (USA)
Co-chair: Daniela Berg (Germany)

Lecture 1: Current definitions and diagnostic criteria: reasons for redefining the disorder
Speaker: Joaquim Ferreira (Portugal)

Lecture 2: The challenge of ‘prodromal’ Parkinson’s disease
Speaker: Ron Postuma (Canada)

Lecture 3: Redefining Parkinson’s disease: possible approaches to developing new diagnostic criteria
Speaker: Daniela Berg (Germany)

Parallel Session: Hallucinations and related phenomena in PD
Room: 516ABC – [PA-T2] – Level of talks: Crosstalk

Learning Objectives:
1. Participants should be able to describe the range of psychotic phenomenon in PD;
2. Identification of factors associated with the pathogenesis and progression of PD psychosis;
3. Discuss evidence based medicine recommendations and integrated treatment options in the management of PD psychosis.

Chair: Ronald Pfeiffer (USA)
Co-chair: Regina Katzenschlager (Austria)

Lecture 1: Prototypical and less common hallucinations
Speaker: Regina Katzenschlager (Austria)

Lecture 2: Where is the nucleus hallucinatorius and how it gets stimulated?
Speaker: Nico Diederich (Luxembourg)

Lecture 3: Management of hallucinations and related symptoms
Speaker: Daniel Weintraub (USA)

Parallel Session: Mitochondrial quality control mechanisms

Learning Objectives:
1. Understand the surveillance mechanisms acting at the molecular, organelle, and cellular levels that monitor mitochondrial integrity and ensure the maintenance of mitochondrial proteostasis;
2. Identify the molecular mechanisms by which Pink1 and Parkin regulate the selective removal of impaired mitochondria by autophagy;
3. Recognize the molecular machinery responsible for mitochondrial fusion/fission and cristae morphology and understand how alterations in these pathways can impair mitochondrial trafficking and distribution and lead to neurodegeneration.

Chair: Edward Fon (Canada)
Co-chair: Charleen Chu (USA)

Lecture 1: Mitochondrial quality control- a matter of life and death for neurons
Speaker: Heidi M. McBride (Canada)

Lecture 2: Mechanisms of mitophagy in Parkinson’s disease
Speaker: Charleen Chu (USA)

Lecture 3: Mitochondrial remodeling in the control of apoptosis
Speaker: Luca Scorrano (Switzerland)
Parallel Session: Ways for people with Parkinson’s to become empowered
Learning Objectives:
1. To provide a broad perspective on different aspects and definitions of “patient empowerment” explaining what it really means to be empowered;
2. Understand ways that empowered patients can inform the body of knowledge on what it’s like living with a chronic disease and how this influence matters;
3. Understand ways how patient empowerment can be achieved.
Chair: Joyce Gordon (Canada)
Co-chair: Fulvio Capitanio (Spain)
Lecture 1: Why and how people with Parkinson’s need empowerment - Finding your own niche
Speaker: Fulvio Capitanio (Spain)
Lecture 2: Evidence-based self-management practices
Speaker: Patrick McGowan (Canada)
Lecture 3: Increasing Parkinson’s advocacy effectiveness with lessons learned from other diseases
Speaker: TBD

Workshop: Sleep and fatigue in PD
Room: 512GH – [WS-T2] – Level of talks: Crosstalk
Learning Objectives:
1. To review the epidemiology and natural history of sleep disorders and fatigue in PD;
2. To review validated tools for measuring fatigue and diagnosing sleep disorders;
3. To review possible treatment modalities, both pharmacological and non-pharmaceutical.
Introduction: Overview of sleep, sleepiness and fatigue in PD
Speaker: Joseph H Friedman (USA)
Case Presentations: Panelists: Oksana Suchowersky (Canada), Susan Bressman (USA) and Nathalie Bolduc (Canada)

Workshop: Ethical dilemmas posed by new diagnostic and therapeutic technologies
Learning Objectives:
1. To acquire the basis of ethics;
2. To learn, through case presentations, about the types of ethical issues;
3. To better understand rational justification for ethical decisions.
Introduction: Overview of ethics in medicine
Speaker: John Loike (USA)
Panel Discussion: Panelists: John Loike (USA), Hubert Fernandez (USA), Jon Stamford (UK) and Karl Friedl (USA)
**Workshop:** Tricks of the trade: clever strategies to improve mobility  
**Room:** 513ABC – [WS-T4] – **Level of talks:** Crosstalk  
**Learning Objectives:**  
1. Explore clever strategies to overcome challenges to daily mobility (suggestions from professionals and PWP’s);  
2. Demonstrate the integration of strategies to improve mobility into daily life (videos, live demonstrations);  
3. Discuss potential mechanisms underlying strategy effectiveness.  
**Introduction:** Overview of Idea Behind Strategies for improving mobility  
*Speaker:* Terry Ellis (USA)  
**Panel Discussion:** *Panelists:* Terry Ellis (USA), Mariella Graziano (Luxembourg), Samyra Keus (Netherlands) and Pam Quinn (USA)

**FRENCH TRACK – 1:30 PM to 3:00 PM**

**French Track:** (See full track on page 45)  
**Room:** 518ABC – [FR-T1] – **Level of talks:** Crosstalk in French  
**Chair:** Michel Panisset (Canada)  
**Lecture 1:** Advances in the genetics of Parkinson’s disease  
*Speaker:* Nicolas Duprê (Canada)  
**Lecture 2:** The experimental models of Parkinson’s disease: Are they useful?  
*Speaker:* Marie-Francoise Chesselet (USA)

**PARALLEL SESSIONS II – 3:30 PM to 5:00 PM**

**Parallel Session:** PD or look-alikes: how to diagnose them and what are their long-term prognoses?  
**Room:** 516ABC – [PA-T5] – **Level of talks:** Crosstalk  
**Learning Objectives:**  
1. To learn how to diagnose and differentiate drug-induced parkinsonism from PD and discuss its long-term prognosis;  
2. To learn how to diagnose and differentiate progressive supranuclear palsy from PD and discuss its long-term prognosis;  
3. To learn how to diagnose and differentiate multiple system atrophy from PD and discuss its long-term prognosis.  
**Chair:** Joseph Jankovic (USA)  
**Co-chair:** Irene Litvan (USA)  
**Lecture 1:** Drug Induced Parkinsonism  
*Speaker:* Stewart Factor (USA)  
**Lecture 2:** PD or progressive supranuclear palsy  
*Speaker:* Irene Litvan (USA)  
**Lecture 3:** PD or Multiple system atrophy  
*Speaker:* Cheryl Waters (USA)  

**Parallel Session:** Clinical trial outcomes – What do they really mean?  
**Room:** 517D – [PA-T6] – **Level of talks:** Moderately scientific  
**Learning Objectives:**  
1. Understand the complexities of measuring outcomes of clinical trials;  
2. Be familiar current trials for PD;  
3. Learn about the placebo effect and its consequences on clinical trials.  
**Chair:** Olivier Rascol (France)  
**Co-chair:** Cristina Sampaio (USA)  
**Lecture 1:** Clinical trial endpoints in PD – What is really meaningful?  
*Speaker:* Cristina Sampaio (USA)  
**Lecture 2:** The placebo effect: how it complicates clinical trial results  
*Speaker:* Christopher Goetz (USA)  
**Lecture 3:** Slowing clinical progression in PD – can it be proven in clinical trials?  
*Speaker:* Fabrizio Stocchi (Italy)


**Parallel Session: The search for new delivery methods for drugs**

**Room:** 517A – [PA-T7] – *Level of talks: Crosstalk*

**Learning Objectives:**
1. Understand the relevance of continuous drug delivery for PD;
2. Become familiar with recent developments in the field of oral and non-oral drug delivery;
3. Critically discuss the potential role of gene therapy in the field of PD.

**Chair:** David Brooks (UK)
**Co-chair:** Peter LeWitt (USA)

**Lecture 1:** Improving oral drug delivery in PD – recent advances  
*Speaker:* Peter LeWitt (USA)

**Lecture 2:** Infusion therapies and other non-oral routes of drug delivery  
*Speaker:* Angelo Antonini (Italy)

**Lecture 3:** Delivering therapeutic genes into the brain – a future way of drug delivery?  
*Speaker:* Stephane Palfi (France)

**Parallel Session: Is PD an axonopathy?**

**Room:** 517C – [PA-T8] – *Level of talks: Highly scientific*

**Learning Objectives:**
1. Understand the pathological findings supporting the presence of axonopathy in PD;
2. Understand evidence for primary synaptic pathology in PD and its implication for treatment;
3. Understand evidence and implications for altered axonal transport in PD.

**Chair:** Maria Spillantini (UK)
**Co-chair:** Sreegana Chandra (USA)

**Lecture 1:** Pathological evidence for axonopathy in Parkinson’s disease  
*Speaker:* Dennis Dickson (USA)

**Lecture 2:** Evidence for synaptic dysfunction in Parkinson’s disease  
*Speaker:* Sreegana Chandra (USA)

**Lecture 3:** Alterations in axonal transport in Parkinson’s disease  
*Speaker:* Scott Brady (USA)

**Workshops – 3:30 PM to 5:00 PM**

**Workshop: Choosing a care facility: When is it time? What are the options?**

**Room:** 513DEF – [WS-T5] – *Level of talks: Crosstalk*

**Learning Objectives:**
1. Learn when it is time to consider a care facility and what are the alternatives;
2. Explore models of informed care from around the world that maximize comfort, care and activity for Parkinson patients;
3. Learn the challenges and successful approaches used to advocate for systems that meet the specific needs of PD patients.

**Introduction:** Overview of Care Models and Options  
*Speaker:* Elaine Book (Canada)

**Case Presentations:** Global Care Models  
*Panelists:* Maria Barretto (India), Marten Munneke (Netherlands) and Ruth Hagestuen (USA)

**Workshop: Do experimental models of Parkinson’s disease predict treatment outcome?**

**Room:** 513ABC – [WS-T6] – *Level of talks: Moderately scientific*

**Learning Objectives:**
1. To learn about the main experimental models of PD;
2. To understand the key challenges between the preclinical and clinical studies;
3. To participate in a discussion about potential remedy.

**Overview:**  
*Speaker:* Anthony Lang (Canada)

**Panel Discussion:**  
*Panelists:* Anthony Lang (Canada), Serge Przedborski (USA), Etienne Hirsch (France) and Ted Dawson (USA)
**Workshop:** Complementary and integrative medicine  
**Room:** S12EF – [WS-T7] – Level of talks: Crosstalk

**Learning Objectives:**
1. Learn about the fields of alternative, complementary and integrative medicines;
2. Recognize the art and the science of these therapies;
3. Understand the categories of integrative medicine/complementary and alternative medicines, including a discussion of the scientific evidence, the risks, the potential benefits and the future of these therapies most commonly used by the PD community.

**Introduction:** Insights into Complementary Therapies  
*Speaker:* Monique Giroux (USA)

**Panel Discussion:** The Art and the Science of Complementary Therapies  
*Panelists:* Monique Giroux (USA), Louis Tan (Singapore) and Angela Robb (USA)

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**Workshop:** Dance and Parkinson’s: Why and How?  
**Room:** S12GH – [WS-T8] – Level of talks: Crosstalk

**Learning Objectives:**
1. Describe the research evidence supporting the benefits of dance in PD;
2. Describe the essential elements of dance thought to mediate improvements in function;
3. Discuss ways to incorporate dance into your life: community based models.

**Overview:** How do we know dance helps people with Parkinson’s?  
*Speaker:* Gammon Earhart (USA)

**Panel Discussion:** Let’s dance! Showing the results of movement  
*Panelists:* Gammon Earhart (USA), David Leventhal (USA), Maura Fisher (Canada), Diane Côté (Canada) and Joanabbey Sack (Canada)

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**FRENCH TRACK – 3:30 PM to 5:00 PM**

**French Track:** (See full track on page 45)  
**Room:** S18ABC – [FR-T2] – Level of talks: Crosstalk in French

**Chair:** Anne-Louise Lafontaine (Canada)

**Lecture 1:** The problem of the accumulation of toxic proteins and the significance of the quality control mechanisms in Parkinson’s disease  
*Speaker:* Edward Fon (Canada)

**Lecture 2:** Non-motor manifestations of Parkinson’s disease  
*Speaker:* Sylvain Chouinard (Canada)

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**ROUNDTABLE – 3:30 PM to 5:00 PM**

**Roundtable:** Meet the Experts  
**Room:** S11C – [RT-T] – Level of talks: Crosstalk

**Table 1:** DBS: A Team Effort  
*Co-hosts:* Elena Moro (France) and David Simmonds (Canada)

**Table 2:** Effective Fundraising Models for PwP founded non-profit organizations: How to survive  
*Hosts:* Fulvio Capitanio (Spain) and Tom Isaacs (UK)

**Table 3:** Non-motor Symptoms & PD  
*Host:* Ronald Pfeiffer (USA)

**Table 4:** Genetic Testing & PD: What questions you should be asking  
*Host:* Susan Bressman (USA)

**Table 5:** Parkinson’s disease and cancer (repeated on Friday)  
*Host:* Rivka Inzelberg (Israel)

**Table 6:** Staying engaged and raising children after a Parkinson’s diagnosis  
*Hosts:* Soania Mathur (Canada), and Sharon Daborn (Australia)

**Table 7:** Parkinson’s disease & women  
*Hosts:* Claire Henchcliffe (USA) and Sara Riggare (Sweden)

**Table 8:** Flying solo – living alone with Parkinson’s  
*Co-hosts:* Cathi Thomas (USA) and Ryan Tripp (Canada)

**Table 9:** Service dogs and Parkinson’s: Everything you need to know  
*Co-hosts:* Renee Le Verrier (USA) and Carolyn Weaver (USA) & guide dogs

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**Session Levels**
- Minimal or no scientific background required for these sessions
- Moderate-level scientific sessions
- High-level scientific sessions
WRAP-UP – 5:15 PM to 6:30 PM

Room: 517D
Facilitator: David Iverson (USA)
Panelists: Anthony Lang (Canada), Kapil Sethi (USA), Joseph H Friedman (USA), Janis Miyasaki (Canada), David Brooks (UK), Roshan Cools (Netherlands) and Alex Tröster (USA)

HOT TOPICS – 8:00 AM to 9:00 AM

Room: 517AB
Moderator: Eduardo Tolosa (Spain)
Bin Hu (Canada)
P12.08 Concurrent Arm Swing-Stepping (CASS) test for dual task-related movement incoordination and hesitation in Parkinson’s disease
Ianai Fishbein (USA)
P06.06 Altered Alpha Synuclein degradation and augmentation of Parkinson disease phenotype in a transgenic mouse model
Daniel Levesque (Canada)
P11.07 Unilateral 6-OHDA lesion and Dopa administration in Nur77 knockout rats reveal an important role of this transcription factor in Parkinson’s disease and its treatment
Rob Skelly (UK)
P34.07 Does a specialist Parkinson’s unit improve outcomes for hospitalised Parkinson’s patients?

Session supported by an unrestricted educational grant from Impax Pharmaceuticals

PLENARY SESSION – 9:10 AM to 11:10 AM

New Views on the Management of Parkinson's disease
Room: 517AB – [PL-F] – Level of talks: Crosstalk

Learning Objectives:
1. Appreciate the experimental developments and current clinical applications of cell and gene-based technologies;
2. Learn about non-medical interventions, including lifestyle activities, self-management and empowerment aspects;
3. Understand the pros and cons of a multidisciplinary treatment approach.

Chair: Eduardo Tolosa (Spain)
Co-chair: Alice Templin (Canada)

Lecture 1: Cell and gene-based technologies for restorative and neuroprotective therapies
Speaker: Roger Barker (UK)

Lecture 2: Exercise, diet, and other lifestyle activities as treatments for Parkinson disease
Speaker: Marten Munneke (Netherlands)

Lecture 3: Empowered patients and how they can help improve healthcare
Speaker: Dave deBronkart (USA)

Lecture 4: Roles for healthcare professionals: multidisciplinary care for Parkinson disease
Speaker: Nir Giladi (Israel)

Session supported by an unrestricted educational grant from Merz Pharma

SPECIAL LECTURE – 11:45 AM to 1:15 PM

Special Lecture: Living Positively After a Diagnosis of Parkinson’s
Room: 517D – [SLL-F]

Introduction by: Robin Elliott (USA)
Speakers: Rich Clifford (USA), Soania Mathur (Canada) and Alex Flynn (UK)
PARALLEL SESSIONS I – 1:30 PM to 3:00 PM

Parallel Session: Update on Gaucher and Parkinson’s diseases
Room: 517D – [PA-F1] – Level of talks: Crosstalk

Learning Objectives:
1. Understand the connection between mutations that cause Gaucher disease and PD;
2. To acquire knowledge about the link between Gaucher’s disease and synucleinopathies;
3. To understand how treatments developed for Gaucher disease may be beneficial in PD.

Chair: Susan Bressman (USA)
Co-chair: Pablo Sardi (USA)

Lecture 1: What is new about the link between Gaucher mutations and Parkinsonism?
Speaker: Roy Alcalay (USA)

Lecture 2: Exploring mechanisms that underlie the link between mutations in the Gaucher disease gene and synucleinopathy risk
Speaker: Michael Schlossmacher (Canada)

Lecture 3: How the understanding of Gaucher could lead to new therapies for Parkinson’s
Speaker: Pablo Sardi (USA)

Parallel Session: New insights into Parkinson’s disease from experimental cell- and gene-based strategies

Learning Objectives:
1. Learn about recent developments in the use of human embryonic stem cells, and induced pluripotent stem cells, to generate dopamine neurons for cell replacement in PD;
2. Learn about two novel strategies to modify disease progression in PD based on insights in neurotrophic factor signalling;
3. Learn about the role of the development transcription factor Nurr1 as a mediator of neurodegeneration in PD.

Chair: Roger Barker (UK)
Co-chair: Mickael Decressac (Sweden)

Lecture 1: Use of human ES and iPS cells for cell replacement in Parkinson’s disease.
Speaker: Malin Parmar (Sweden)

Lecture 2: Role of Sonic hedgehog in maintaining striatal homeostasis
Speaker: Andreas Kottmann (USA)

Lecture 3: Nurr1 as a therapeutic target for neuroprotection and disease modification in PD
Speaker: Mickael Decressac (Sweden)

Parallel Session: Neurobiology and treatment of dyskinesias
Room: 517C – [PA-F3] – Level of talks: Moderately scientific

Learning Objectives:
1. Increase the knowledge on the various neurotransmitters implicated in L-DOPA induced dyskinesia describing their possible interactions;
2. Provide a broad perspective of the novel therapeutic strategies emerging from preclinical studies utilizing experimental models of PD;
3. Increase the understanding of the role of both short and long term synaptic mechanisms implicated in the motor and behavioral complications of chronic L-DOPA therapy.

Chair: Karl Friedi (USA)
Co-chair: Erwan Bezard (France)

Lecture 1: Maladaptive plasticity in L-DOPA-induced dyskinesia: emerging role of serotonin transmission and other presynaptic factors
Speaker: Angela M. Cenci (Sweden)

Lecture 2: Pre- and post-synaptic molecular mechanism underlying L-DOPA-induced dyskinesia as possible new pharmacological targets
Speaker: Erwan Bezard (France)

Lecture 3: Multiple dopamine-dependent synaptic mechanisms underlying dyskinesia in animal models
Speaker: Barbara Picconi (Italy)
Parallel Session: Pathophysiology and management of head drop and bent spine in PD: Are they dystonia or myopathy or both?

Learning Objectives:
1. To learn current understanding of the mechanism of dropped head and bent back in PD;
2. To learn how to differentiate similar condition with different etiology;
3. To learn current management of dropped head and bent back.

Chair: Ryuji Kaji (Japan)
Co-chair: Simone Spuler (Germany)

Lecture 1: Myopathy causing camptocormia in Idiopathic Parkinson’s disease
Speaker: Simone Spuler (Germany)

Lecture 2: Camptocormia: pathogenesis, classification, and response to therapy
Speaker: Joseph Jankovic (USA)

Lecture 3: Dropped head syndrome in Parkinson’s disease
Speaker: Kenichi Kashihara (Japan)

Workshop: What you need to know about DBS: Selection, side effects, and new device development
Room: 513DEF – [WS-F1] – Level of talks: Moderately scientific

Learning Objectives:
1. To provide an interactive educational program focusing on the latest advances in and the practical aspects of deep brain stimulation for Parkinson’s disease;
2. To discuss rationale for selection of patients, targets, devices, and stimulation parameters;
3. To review the potential risks and how to minimize the potential long-term effects and complications related to deep brain stimulation.

Overview:
Deep brain stimulation
Speaker: Michael Okun (USA)

Case Presentations:
Panelists: Michael Okun (USA) and Elena Moro (France)

Workshop: Is PD an accelerated form of aging?

Learning Objectives:
1. To learn the selective vulnerabilities seen in PD and normal aging;
2. To understand the function and electrophysiological changes seen in PD and normal aging;
3. To be able to discuss new models of normal aging and illustrate their relevance to PD.

Overview:
Aging and PD
Speaker: Timothy J. Collier (USA)

Panel Discussion:
The implication of cell function in determining differential vulnerabilities
Panelists: Jeffrey Kordower (USA), James Surmeier (USA) and Timothy Collier (USA)

Workshop: Pain in PD
Room: 512EF – [WS-F3] – Level of talks: Crosstalk

Learning Objectives:
1. To gain an understanding of the multifaceted nature of pain syndromes in PD;
2. To understand the neurophysiological substrate of pain in PD;
3. To develop a practical approach to the management of pain in PD.

Overview:
Pain in PD
Speaker: Blair Ford (USA)

Panel Discussion:
A practical and clinical approach to treating pain in PD
Panelists: David Lussier (Canada), and Blair Ford (USA)
**Workshop:** Speech and Parkinson’s  
**Room:** 512GH – [WS-F4] – *Level of talks: Crosstalk*  
**Learning Objectives:**  
1. To gain an understanding of the complex skills needed for effective speech production as shown through recent evidence;  
2. Understand the best approaches to deal with the voice, speech, and language changes of PD over the course of the illness and most effective interventions;  
3. To learn best practice Speech Language Pathology interventions and options for treatment in the early, middle and late stages of Parkinson’s.  
**Overview:** Models of care on speech for people with Parkinson’s  
*Speaker: Angie Roberts-South (Canada)*  
**Panel Discussion:** Panelists: Angie Roberts-South (Canada), Lorraine Ramig (USA) and Bonnie Bereskin (Canada)

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**FRENCH TRACK** – 1:30 PM to 3:00 PM  
**French Track:** (See full track on page 45)  
**Room:** 518ABC – [FR-F1] – *Level of talks: Crosstalk in French*  
**Chair:** Sylvain Chouinard (Canada)  
**Lecture 1:** Is there a link between Parkinson’s disease and the Gaucher metabolic disorder?  
*Speaker: Guy Rouleau (Canada)*  
**Lecture 2:** How imaging technologies can inform about the brain function in Parkinsonian patients  
*Speaker: Alain Dagher (Canada)*

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**PARALLEL SESSIONS II** – 3:30 PM to 5:00 PM  
**Parallel Session:** Freezing and falls  
**Room:** 517A – [PA-F5] – *Level of talks: Crosstalk*  
**Learning Objectives:**  
1. Describe the potential mechanisms underlying freezing of gait and the role of cueing in reducing freezing;  
2. Describe the mechanisms underlying falling and the evidence on the modifiability of postural control deficits in PD;  
3. Discuss the evidence on the benefits of exercise in reducing falling in PD.  
**Chair:** Nir Giladi (Israel)  
**Co-chair:** Alice Nieuwboer (Belgium)  
**Lecture 1:** Freezing: Underlying mechanisms and the role of cueing  
*Speaker: Alice Nieuwboer (Belgium)*  
**Lecture 2:** Why do persons with PD fall? Does treatment help to reduce falling?  
*Speaker: Fay Horak (USA)*  
**Lecture 3:** The benefits of exercise in reducing falling in PD  
*Speaker: Victoria Goodwin (UK)*  
**Parallel Session:** Promising approaches to identify and validate biomarkers  
**Room:** 516ABC – [PA-F6] – *Level of talks: Crosstalk*  
**Learning Objectives:**  
1. To learn about disease signatures and markers;  
2. To appreciate the array of techniques available to search for biomarkers;  
3. To be informed about new and promising biomarkers for PD.  
**Chair:** Kapil Sethi (USA)  
**Co-chair:** David Standaert (USA)  
**Lecture 1:** What are biomarkers and why do we need them?  
*Speaker: David Standaert (USA)*  
**Lecture 2:** Update on unbiased methodologies to identify biomarkers  
*Speaker: Howard Federoff (USA)*  
**Lecture 3:** Emerging biomarkers  
*Speaker: Claire Henchcliffe (USA)*  

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**Session Levels**  
- Minimal or no scientific background required for these sessions  
- Moderate-level scientific sessions  
- High-level scientific sessions
Parallel Session: Drug development challenges: from the pharmaceutical industry, bioethics and patient advocacy perspective

Room: 517D – [PA-F7] – Level of talks: Crosstalk

Learning Objectives:
1. To understand the challenges to drug development from a variety of perspectives;
2. Appreciate the difficult course of drug development from a bioethics perspective;
3. Understand the role of patient advocates.

Chair: Marc Brinkman (Germany)
Co-chair: Bernard Ravina (USA)

Lecture 1: Drug development challenges-Pharmaceutical industry perspective
Speaker: Bernard Ravina (USA)

Lecture 2: Drug development challenges – A bioethics perspective
Speaker: Spencer Hey (Canada)

Lecture 3: Drug development challenges-Patient advocacy perspective
Speaker: Tom Isaacs (UK)

Parallel Session: How should levodopa induced dyskinesia be managed today?

Room: 517C – [PA-F8] – Level of talks: Highly scientific

Learning Objectives:
1. To understand the subtypes of levodopa induced dyskinesias (LID) in Parkinson Disease (PD);
2. Be able to evaluate and assess severity of dyskinesia in patients with LID;
3. Understand how to prevent and manage levodopa-induced dyskinesia.

Chair: Kailash Bhatia (UK)
Co-chair: Jose Obeso (Spain)

Lecture 1: Recognizing the subtypes and assessing severity of dyskinesia and the clinical impact
Speaker: Beom S. Jeon (South Korea)

Lecture 2: Current management of LID – medical and surgical
Speaker: Jose Obeso (Spain)

Lecture 3: Future Management of LID: What’s in the pipeline?
Speaker: Susan Fox (Canada)

Session supported through an unrestricted educational grant from Adamas Pharmaceuticals

Workshop: The role of people with Parkinson’s in the research process: How are they prepared and what can they do?

Learning Objectives:
1. To understand how engaging people with Parkinson’s informs the research process;
2. Be able to list ways to engage PwPs in the research process;
3. Understand how to improve communication between researchers and research participants in clinical trials.

Introduction: Overview of the research process and advances in communication between researchers and participants
Speaker: Diane Cook (USA)

Panel Discussion: Panelists: Benzi Kluger (USA) (Researcher), Diane Cook (USA), Veronica Todaro (USA) and Lily Cappelletti (USA)

Workshop: Which physical and mental exercises are good for people with Parkinson’s?

Learning Objectives:
1. Understand the physiological and scientific basis for physical and cognitive rehabilitation in Parkinson’s disease;
2. Learn the different modalities of physical and cognitive rehabilitation in Parkinson’s disease reviewing the evidence from clinical trials;
3. Understand the role of neuropsychologists, exercise trainers, and physical therapists in the management of Parkinson’s disease.

Overview: Exercise, physical therapy, and benefits to the brain of Parkinson’s patients
Speaker: Lynn Rochester (UK)

Panel Discussion: An active mind for a healthier life with Parkinson’s: case studies
Panelists: Terry Ellis (US), and Lynn Rochester (UK)
Workshop: Parkinson’s and mood changes: Depression, apathy and anxiety
Room: 512EF – [WS-F7] – Level of talks: Crosstalk

Learning Objectives:
1. Recognize the common behavioral changes seen in anxiety and depressive disturbances in PD;
2. List features that distinguish anxiety and depressive disturbances from healthy affective changes;
3. Identify methods to treat and manage depression, apathy, and anxiety in PD.

Overview: Depression, apathy and anxiety in Parkinson’s disease
Speaker: Laura Marsh (USA)

Panel Discussion: Clinical features and treatment for depression and anxiety in Parkinson’s disease
Panelists: Roseanne Dobkin (USA), and Laura Marsh (USA)

French Track: (See full track on page 45)
Room: 518ABC – [FR-F2] – Level of talks: Crosstalk in French

Chair: Pierre Blanchet (Canada)

Lecture 1: Dyskinesias: Mechanism and treatment
Speaker: Erwan Bezard (France)

Lecture 2: Parkinson’s disease is much more than a disease of dopamine
Speaker: Etienne Hirsch (France)

Roundtable: Meet the Experts
Room: 511C – [RT-F] – Level of talks: Crosstalk

Table 1: How can occupational therapists help manage memory challenges?
Host: Margarita Makoutonina (Australia)

Table 2: Motor fluctuations & dyskinesias
Host: Angie Jankovic (USA)

Table 3: Speech and PD
Host: Ray Chaudhuri (UK)

Table 4: Non-motor Symptoms & PD
Host: Etienne Hirsch (France)

Table 5: Issues specific to Adolescents of Parents with Parkinson’s
Host: Elaine Book (Canada)

Table 6: What are animal models, why are they important in PD research and what are the challenges of using them?
Host: Marie-Francoise Chesselet (USA)

Table 7: Parkinson’s disease and cancer
Host: Rivka Inzelberg (Israel) – Note: Also offered Thursday

Table 8: Open Discussion on Parkinson’s disease & the WPC
Hosts: Stanley Fahn (USA) and Jon Stoessl (Canada)

Table 9: Deep Brain Stimulation
Host: Michael Okun (USA)

Wrap-Up – 5:15 PM to 6:15 PM
Room: 517D
Facilitator: David Iverson (USA)
Panelists: Terry Ellis (USA), Eduardo Tolosa (Spain), Howard Federoff (USA), Blair Ford (USA) and Kailash Bhatia (UK)

Closing Remarks – 6:15 PM to 6:30 PM
Room: 517D
Québec hospitality with snacks, drinks and raffle
SESSIONS EN FRANÇAIS

Douze conférences en français sur la question de la maladie de Parkinson
Salle : 518ABC
Audience ciblée : Chercheurs, professionnels du domaine médical et public non-médical incluant les patients parkinsoniens francophones.
But : Permettre aux participants d’être informés au sujet de la recherche clinique et fondamentale touchant à la maladie de Parkinson. Donner aux participants une introduction à ces sujets, en langage accessible et détaillé, et leurs expliquer pourquoi ces recherches peuvent conduire à une meilleure compréhension de la maladie de Parkinson, de son diagnostic et/ou de son traitement.

JOUR 1 – Mercredi 2 octobre 2013

SESSION I – 13 h 30 à 15 h [FR-W1]
Modérateur : Serge Przedborski (USA)
Conférence 1 : Il y a-t-il un défaut de l’énergie cellulaire dans la maladie de Parkinson : l’importance des mitochondries ?
Orateur : Celine Perier (Spain)
Conférence 2 : Essais cliniques : les obstacles et les nouvelles percées
Orateur : Olivier Rascol (France)

SESSION II – 15 h 30 à 17 h [FR-W2]
Modérateur : David Lussier (Canada)
Conférence 3 : Y a-t-il un rôle pour les thérapies géniques et les cellules souches dans le traitement de la maladie de Parkinson ?
Orateur : Stephane Palfi (France)
Conférence 4 : Docteur, je n’ai plus d’entrain et je dors mal
Orateur : Nico Diederich (Luxembourg)

JOUR 2 – Jeudi 3 octobre 2013

SESSION I – 13 h 30 à 15 h [FR-T1]
Modérateur : Michel Panisset (Canada)
Conférence 5 : Progrès sur la génétique de la maladie de Parkinson
Orateur : Nicolas Dupré (Canada)
Conférence 6 : Les modèles expérimentaux de la maladie de Parkinson : quels sont leurs utilités ?
Orateur : Marie-Françoise Chesselet (USA)

SESSION II – 15 h 30 à 17 h [FR-T2]
Modérateur : Anne-Louise Lafontaine (Canada)
Conférence 7 : Le problème de l’accumulation des protéines toxiques et l’importance des mécanismes de contrôle dans la maladie de Parkinson
Orateur : Edward Fon (Canada)
Conférence 8 : Les manifestations non-motrices dans la maladie de Parkinson
Orateur : Sylvain Chouinard (Canada)

JOUR 3 – Vendredi 4 octobre 2013

SESSION I – 13 h 30 à 15 h [FR-T1]
Modérateur : Sylvain Chouinard (Canada)
Conférence 9 : Y a-t-il un lien entre la maladie de Parkinson et la maladie métabolique de Gaucher ?
Orateur : Guy Rouleau (Canada)
Conférence 10 : Comment l’imagerie médicale nous informe-t-elle sur la fonction du cerveau du patient parkinsonien ?
Orateur : Alain Dagher (Canada)

SESSION II – 15 h 30 à 17 h [FR-T2]
Modérateur : Pierre Blanchet (Canada)
Conférence 11 : Dyskinésies : mécanismes et traitements
Orateur : Erwan Bezard (France)
Conférence 12 : La maladie de Parkinson est bien plus qu’une maladie de la dopamine
Orateur : Etienne Hirsch (France)
**Basic Science: Etiology, genetics, epidemiology and toxicants**

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**Basic Science: Cell death, neuroprotection and trophic factors**

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**Basic Science: Protein misfolding and handling**

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**LBP01** Neuropsychological performance in LRRK2 G2019S carriers and non-carriers with Parkinson’s disease
Roy Alcalay, Helen Mejia-Santana, Anat Mirelman, Rachel Saunders-Pullman, Deborah Raymond, Laurie Ozellus, Avi Orr-Urtreger, Lorraine Clark, Nir Giladi, Susan Bressman, Karen Marder

**LBP02** Penetration of LRRK2 G2019S mutation in the Michael J Fox Ashkenazi Jewish (AJ) LRRK 2 Consortium
Karen Marder, Ming Xin Tang, Roy Alcalay, Lorraine Clark, Helen Mejia-Santana, Deborah Raymond, Rachel Saunders-Pullman, Anat Mirelman, Avi Orr-Urtreger, Nir Giladi, Susan Bressman

**LBP03** The Autonomic profile of Ashkenazi Jewish Parkinson’s disease patients carriers of the G2019S mutation in the LRRK2 gene
Tanya Gurevich, Roy Alcalay, Rachel Saunders-Pullman, Anat Mirelman, Avi Orr-Urtreger, Karen Marder, Susan Bressman, Nir Giladi

**LBP04** Differentially deregulated striatal gene expression between striatopallidal and striatonigral neurons following deep brain stimulation in mice
Naomi Visanji, Imam Kamali Sarvestani, Zahra Shams Shoaei, Clement Hamani, Josi Nabunga, Lili-Naz Hazrati

**LBP05** Tau oligomers as novel therapeutic target for PD and neurodegenerative synucleinopathies
Rakez Kayed, Urmila Sengupta, Julia Gerson, Diana Castillo-Carranza, Marcos Guerrero-Munoz, George Jackson

**LBP10** Impairment of cerebral auto-regulation in multiple system atrophy and Parkinson’s disease
Young Jin Kim, Mi-Jung Kim, Sung Reul Kim, Sun Ju Chung

**LBP14** The clinical features of asymptomatic, first degree relatives of Ashkenazi Jewish Parkinson patients, carriers of the G2019S mutation in the LRRK2 gene
Anat Mirelman, Rachel Saunders-Pullman, Roy Alcalay, Avi Orr-Urtreger, Lorraine Clark, Laurie Ozellus, Karen Marder, Nir Giladi, Susan Bressman

**LBP15** Crucial contribution for asymmetric reduction of arm and leg swing in Parkinson’s disease: Rigidity versus Bradykinesia?
Kyum-Yil Kwon, Minjik Kim, Seon-Min Lee, Sung Hoon Kang, Hye Mi Lee, Seong-Beom Koh

**LBP16** Impaired perception of facial expressions of emotion and its link to facial masking in Parkinson’s disease
Michelle Marneweck, Romina Palermo, Geoff Hammond

**LBP17** Olfaction in LRRK2 G2019S Mutation Carriers

**LBP24** The effect of dopaminergic medication on muscle performance in people with Parkinson’s disease-related fatigue
Dimitrios Katsavellis, Sam K. Morton, Terry L. Grindstaff, A. Joseph Threlkeld

**LBP25** The role of optic flow on locomotion in young adults during overground walking
Xiaolin Ren, Robert Wagenaar, Cheng-Chieh Lin, Alice Cronin-Golomb

**LBP26** Long-term Observation of Speech and Language in Patients with Parkinson’s Disease under Continuous Levodopa/Carbidopa Intestinal Gel Therapy
Auguste Tautscher-Basnett, Volker Tomantschger, Manfred Freimueller

**LBP27** Central components of quadriceps fatigue are dopamine dependent
A. Joseph Threlkeld, Sam K. Morton, Dimitrios Katsavellis, Terry L. Grindstaff
**Basic Science: Cell death, neuroprotection and trophic factors**

**P02.01** Neuroprotective properties of oleuropein against 6-hydroxydopamine-induced cytotoxicity in neuronal PC12 cells  
*Imene Achour, Manon Legrand, Anne-Marie Arel-Dubeau, Everaldo Attard, Maria-Grazia Martinoli*

**P02.02** The phytotoxin Curcubitacin E exerts neuroprotective and pro-autophagic effects in an “in vitro” model for Parkinson’s disease  
*Anne-Marie Arel-Dubeau, Fanny Longpré, Everaldo Attard, Maria-Grazia Martinoli*

**P02.04** Measurement of plasma cytokines suggests T helper type 2 dominated T cell dysregulation in Parkinson’s disease  
*Keri Csencsits-Smith, Diane Bick, Mary McGuire, Mya Schiess*

**P02.05** Lmx1a and Lmx1b regulate survival of midbrain dopamine neurons  
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**P02.06** Determination of the neuroprotective effects of SIRT3 in Parkinson’s disease  
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**P02.10** Resveratrol protects dopaminergic cells against high glucose-induced oxidative stress and apoptosis: role of glucose-regulated protein 75  
*Justine Renaud, Julie Bournival, Maria-Grazia Martinoli*

**P02.11** Fasudil administration elevates striatal dopamine and protects against alpha synuclein mediated toxicity  
*Caryl Sortwell, Fredric Manfredsson, Christopher Kemp, Sara Gombash-Lampe, Nathan Kuhn, Katrina Paumler, Jack Lipton, Kathy Séece-Collier, Apryl Pooley, Nathan Levine, Gregory Fink, Hannah Garver, Pullyur MohanKumar, Sheba MohanKumar, Konstantinos Petrulis, Tony Tegler, Audra Kaufman, Jeffrey MacEigean*

**P02.12** Activin A is neuroprotective in the 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) mouse model of Parkinson’s disease  
*Sandy Stayte, Anna Troscher, Maximilian Bamberger, Andrea Abdipranoto, Bryce Vissel*

**P02.13** Enhancement of ATF4 and parkin function as a neuroprotective strategy for Parkinson disease  
*Xiaotian Sun, Pascaline Alme, Lloyd Greene, Oren Levy*

**P02.14** Neuroprotective effects of blueberry anthocyanins in Parkinson’s disease models  
*Mitali A. Tambe, Katherine Strathearn, Susan Roy, Gad G. Youssef, Mary Grace, Quing-Li Wu, James Simon, Mary Ann Lila, Jean-Christophe Rochet*

**P02.15** Effect of a co-administration of neurotrophic factors CDNF and GDNF in a 6-OHDA model of Parkinson’s disease in rats  
*Merja H. Vuotilainen, Susanne Bäck, Päivi Pulkkila, Mart Saarma, Pekka T. Männistö, Raimo K. Tuominen*

**Basic Science: Mitochondria, oxidative stress, inflammation, pathogenesis**

**P04.01** Neuroprotective effects of ATP13A2 and DJ-1 in Parkinson’s disease models  
*Josephat Asiago, Vartika Mishra, Amy Griggs, Susan Roy, Jean-Christophe Rochet*

**P04.02** DJ-1 loss-of-function affects adult neurogenesis in rodent brain  
*Jesus Pascual-Brazo, Veerle Reumers, Luisa Mendes-Osorio, Zeger Debyser, Chris Van den Haute, Veerle Baekelant*

**P04.03** Antioxidant activity of superoxide dismutases protect dopaminergic neurons against degeneration  
*Roberta Filograna, Vanni Ferrari, Luigi Bubacco, Mariano Beltramini, Marco Bisaglia*

**P04.04** The role of intramolecular interactions in parkin activation in vivo  
*Jonathan Krett, Jean-François Trempe, Edward Fon*

**P04.05** Functional compensation of the motor deficits after dopaminergic nigrostriatal system degeneration. DIGE analysis of mitochondrial membranes proteins in relation to early Parkinson’s disease  
*Katarzyna Kuter, Manuela Kratochwil, Urszula Glowacka, Klemencja Berghauzen-Maciejewska, Michiru Sugawa, Krystyna Ossowska, Norbert Dencher*
Basic Science: Animal and cellular models of Parkinsonisms

P06.02 Identification of cis- and trans-regulatory elements and signaling pathways inparkin gene expression — A genomic fugu parkin model
Hei Sio Ao, Sandra Noble, Marc Ekker, Jingwei Sheng, Rajiv Ratan, Lim Kah Leong, Tohru Kitada, Julianna Tomlinson, Michael Schlossmacher

P06.03 Molecular mechanisms of neurodegeneration in the En1+/- mouse model of Parkinson’s disease
Genevieve Beauvais, Ulrika Nordström, Carla M. Lema Tomé, Allyson Cole-Stauss, Jack Lipton, Martin Lundblad, Jennifer A. Steiner, Pátrik Brundin

P06.04 The group II p21-activated kinases as therapeutic targets in LRRK2-related Parkinson’s disease
Laura Civiero, Elisa Belluzzi, Alexandra Bellina, Isabella Russo, Veerle Baekelandt, Luigi Bubacco, Mark R Cookson, Jean-Marc Taymans, Elisa Greggio

P06.05 A reverse engineered Parkinson’s disease gene regulatory network identifies RGS2 as a direct modulator of LRRK2 activity
Julien Duconchet, Hu Li, Maria Guilly, Liliane Glauser, Claudio Troletti, Adamantios Mamas, Min Liu, Allison Citro, Andrew Ferree, Shamol Saha, Zhenyu Yue, Rina Bandopadhyay, Marcie Glicksman, Patrick Aebischer, Darren Moore, James Collins, Benjamin Wolozin

P06.06 Altered Alpha Synuclein degradation and augmentation of Parkinson disease phenotype in a transgenic mouse model
Janal Fishbein, Yien-Ming Kuo, Robert Nussbaum

P06.07 Investigating the impact of alpha Synuclein overexpression in human neurons with a novel viral system
Fella Hammachi, Nicola J. Drummond, Ratsuda Yapom, Tilo Kunath

P06.08 Synergistic effects of mGluR5 antagonism and 5-HT1A/1B agonism in a rat model of L-DOPA-induced dyskinesia
Hanna Iderberg, Daniella Rylander, M Angela Cenci

P06.09 Positive allosteric modulators of mGluR4 can synergize with L-DOPA in alleviating motor abnormalities in a rodent model of Parkinson’s disease
Hanna Iderberg, Sylvain Celanire, Sonia M Poli, Vincent Darmercy, Mikhail Kalinichev, M Angela Cenci

P06.10 Evaluation of anti-parkinson activity of Methanolic extract of Hyoscyamus Niger seeds in stereotaxically induced rotenone rat modal
Dharmendra Khatri, Archana Juvekar

P06.11 Human cathepsin D does not enhance synucleinase activity in wild-type and SNCA-transgenic mice
Tohru Kitada, Qiubo Jiang, Joerg Neddens, Piotr Kolodziej, Daniel Havas, Adel Farah, Juliana Ng, Jason MacLaurin, Yves De Repentigny, Julianna Tomlinson, Ruth Slack, Rashmi Kothary, Birgit Hutter-Paier, Michael Schlossmacher
Investigating the process of axonal degeneration in the 6-hydroxydopamine model of Parkinson’s disease
Andrew Kneynberg, Timothy Collier, Fredric Manfredsson, Nicholas Kanaan

Longitudinal in vivo imaging in a novel model of Parkinson’s disease in minipig
Anne M Landau, Steen Jakobsen, Aage KO Alstrup, Anna C Schacht, Arne Møller, Jens Christian Sørensen, Doris J Doudet

Functional LRRK2 genetic interaction screen in Drosophila
Paul Marcogliese, Sameera Abuash, Elizabeth Abdel-Messih, Ghassan Kabbach, Sarah Seang, Gang Li, Ruth Slack, M. Emadul Haque, Katerina Venderova, David Park

Intrastriatal injection of pre-formed alpha-synuclein fibrils initiates the formation of Lewy body-like intracellular inclusions and nigrostriatal degeneration in naïve rats
Katrina Paumier, Kelvin Luk, Fredric Manfredsson, Nicholas Kanaan, Jack Lipton, Timothy Collier, Chris Kemp, Stephanie Celano, John Trojanowski, Virginia Lee, Caryl Sortwell

LRRK2 interacts and phosphorylates Synapsin I: implication for synaptic vesicle trafficking
Isabella Russo, Antonella Marte, Elisa Belluzzi, Laura Civiero, Daniela Cimaru, Luigi Bubacco, Giovanni Piccoli, Elisa Greggio, Franco Onofri

Parkinsonian features in aging GFAP.HMOX1 transgenic mice overexpressing human HO-1 in the astroglial compartment
Wei Song, Adrienne Liberman, Hyman Schipper

Gene expression changes induced by long-term subthalamic nucleus deep brain stimulation in rats

Distinct patterns of gene expression in the striatum of dyskinetic versus non-dyskinetic responders to levodopa priming in the 6-hydroxydopamine lesioned rat
Kathy Steece-Collier, Allyson Cole-Strauss, Kellie Sisson, Timothy Collier, Caryl Sortwell, Jack Lipton

SYNerGY Mice: Modeling GBA1 Dysfunction and Human Synucleinopathy Risk
Julianna Tomlinson, Paul Manninger, Dina Elleithy, Fanyi Meng, Mirela Hasu, Diane Lagace, Gregory Grabowski, Robert Nussbaum, Michael Schlossmacher

Further characterization of a novel, environmentally induced progressive rodent model of Parkinson’s disease
Jackalina Van Kampen, David Baranowski, Christopher Shaw, Denis Kay

LRRK2 G2019S knock in Mice display progressive alterations in dopamine release and metabolism
Mei Yue, Kelly Hinkle, Paul Davies, Erin Bowles, Bahareh Behrouz, Sarah Lincoln, Joel Beevers, Dario Alessi, Dennis Dickson, Matthew Farrer, Heather Metrose

Neuronal characterization of mesenchymal dog stem cells into dopaminergic neurons
Ximena Zottig, Julie Bourmival, Maria-Grazia Martinoli

Basic Science: Dopamine, receptors and other neurotransmitters

Mechanisms of activation of dopamine D1 receptors by rotigotine: a route to novel Parkinson’s disease drugs
Sang-Min Lee, Richard Mailman

P11 gene therapy for Parkinson’s disease motor dysfunction and L-Dopa induced dyskinesias
Robertta Marongiu, Mihaela A. Stavarache, Sergei A. Musatov, Margarita Arango-Lievano, Paul Greengard, Michael G. Kaplitt

Dopamine inhibits protein L-isoaspartyl methyltransferase at both protein and gene levels in SH-SY5Y cells
Dahmane Ouazia, Louis-Charles Jr. Levros, Eric Rassart, Richard Desrosiers

Striatal pre-enkephalin overexpression improves motor symptoms and neuronal insults in the MPTP mouse model of Parkinson’s disease
Pershia Samadi, Stéphanie Bissonnette, Sophie Muratot, S. Sébastien Hébert

Differential morphological changes of D2 versus D1-expressing striatal neurons in a transgenic mice model of Parkinson’s disease
Maria Gabriela Sánchez, Cyril Boris, Dave Gagnon, Yves De Koninck, Jean-Martin Beaulieu, André Parent, Martin Parent

The effect of noradrenaline depletion on motor impairment and dopamine cell loss in a rat model of Parkinson’s disease
Jenny Shin, James Rogers, Anders Björklund, Manolo Carta
Basic Science: Electrophysiology & functional imaging, optogenetics

P10.01 A functional magnetic resonance imaging approach towards understanding the circuit-level effects of deep brain stimulation
Daniel Albaugh, John Younce, Hsin-Yi Lal, Yen-Yu Ian Shih

P10.02 Brain networks involved in learning a dance: a model mechanism for examining plasticity during dance therapy
Joseph DeSouza, Rachel Bar, Hedieh Tehrani

P10.03 Quantitative evaluation of hypokinesia in Parkinson disease using sensor gloves
Tomas Diaz, Lazaro Gomez, Marlo Alvarez, Amado Diaz, Eduardo Martinez

P10.04 Pre- and post-synaptic dopaminergic dysfunction in multiple system atrophy: combined [18F]FP-CIT and [18F]FDG-PET study
Mi-Jung Kim, Jae Seung Kim, Sooyeoun You, Young Jin Kim, Sung Reul Kim, Sun Ju Chung

P10.05 Changes in resting state EEG following motor performance in PD
Claire Moisello, Daniella Blanco, Jing Lin, Andrea Loggini, Alessandro Di Rocco, Maria Felice Ghilardi

P10.06 Increase of Intra-motor-network connectivity in Parkinson’s disease patients – an fMRI study with graph theory approach
Atsuko Nagano-Saito, Kristina Martinu, Oury Monchi Monchi

P10.07 Disease and sex-related differences in daily electromyography influence functional performance in Parkinson’s disease
Kaitlyn Roland, Gareth Jones, Jennifer Jakobi

P10.08 Altered striatal spiny neuron activity as a therapeutic target in Parkinson’s disease
Arun Singh, Klaus Mewes, Robert Gross, Mahlon DeLong, Stella Papa

P10.09 Restoration of normal striatal dopamine responses with NMDA receptor blockade
Arun Singh, Lisa Potts, Kenneth Burke, Jessica Whithbear, Bhagya Laxmi Dyavar Shetty, Stella Papa

Care Delivery & Quality of Life: Caregiving, relationships, respite care, families

P27.01 The relationship between patient symptoms and caregiver burden in advanced stage Parkinson’s disease
Nina Browner, Jessica Katz, Lindsay Prizer, Amber Baxley

P27.02 The relationship between caregiver burden and negative social exchanges in Parkinson’s disease
Roseanne Dobkin, Michael Gara, Margery Mark, Matthew Menza

P27.03 Carer benefit from a domiciliary multidisciplinary specialist rehabilitation service for people with Parkinson’s and their carers: the SPIRIT project
Heather Gage, Linda Grainger, Sharlene Ting, Peter Williams, Christina Chorley, Gillian Carey, Neville Borg, Karen Bryan, Beverly Castleton, Patrick Trend, Julie Kaye, Derick Wade

P27.05 Hanging by a shoestring: Respecting spouses’ desire to remain at home in Advanced Parkinson’s Disease
Barbara Habermann

P27.06 Reduction of Care Partner Burden through Care Partner Training
Connie Hoppe, Karen McDonough

P27.07 “Do I look like I care?” Parkinson’s disease and its potential effects upon relationships
Jackie Hunt Christensen

P27.08 Different impact of Parkinson’s disease symptoms on patients and caregivers
Kenichi Kashihara, Kanako Hirono, Tetsuya Maeda, Atsushi Takeda

P27.10 Effects of PD Diagnosis on Caregiver Health Care and Work Issues
Jan Rabinowitz

P27.11 Providing instruction of Reiki first degree as a complementary therapy to help improve the lives of Parkinson’s disease (PD) carepartners/caregivers
Angela Robb, Karl Robb

P27.12 Quality of life and caregiver burden among hispanic subjects with Parkinson’s disease living in the US and Mexico
Mayela Rodriguez-Violante, Claudia Martinez, Margaret Anne Coles, Amin Cervantes-Arriaga, Azyadeh Camacho-Ordoñez, Paulina Gonzalez-Latapi
Docum enting the L ived Experience of U nconditiona l Love in Parkinson Care Giving
Ramon Ruiz Sampao, Sheree L. Loftus

What measures of disability predict caregiver burden in Parkinson’s disease
Tanya Simuni, Mary J. Kwasny, Odinachi Oguh, David Eugene Klein

Turning strain into strength: Investigating caregiver growth in the loved ones of persons with Parkinson’s Disease (PD)
Deborah Worboys, Anne Tolan, Andrea Langmont-Mills

Quantitative assessment of home and community mobility of persons with Parkinson disease and their spousal caregivers
Lynn Zhu, Catherine Lavigne-Pelletier, Margaux Blamoutier, Simon Brière, Matt Dibsdale, Patrick Boissy, Mandar Jog, Christian Duval, Mark Speechley

Care Delivery & Quality of Life: Alternative & complementary therapies / Creativity

Generating rhythm: Music therapy in Parkinson’s care
Amy Clements-Cortes

Long-term effectiveness of Alexander Technique (AT) in managing motor symptoms of Young Onset Parkinson’s Disease (PD)
Candace Cox

Yoga for Parkinson’s disease: a competency-based course for yoga teachers
Tamara DeAngelis, Renee Le Verrier, Cathi Thomas, Beth Gold-Bernstein, Lorraine Jacobsohn

Comparative biomechanics from ice skating and regular terrain locomotion amongst people living with Parkinson disease
Jon Doan, Natalie de Bruin, Patrick Bartoshyk, Mike Amatto, Kevin McLarty, Lesley Brown

Developing a collaboration in music therapy and physiotherapy for older adults with Parkinson’s disease: A pilot project
Hélène Gaudreau, Annie Bélanger

Neurologic music therapy interventions: a whole picture approach for people with Parkinson’s disease
Sandra Holten

An arts & movement program designed to link exercise, creativity and social interaction
Renee LeVerrier, Jane Arsham, Michael Kleinman, Cathi Ann Thomas, Marie Saint-Hilaire

Providing instruction of Reiki first degree as a complementary therapy to help improve the lives of those living with Parkinson’s disease
Karl Robb, Angela Robb

Incorporating community based artists into a Parkinson’s disease care program at an NPF Center of Excellence
Rose Wichmann, Sandra Holten

Combination treatment with osteopath and Chinese deep tissue massage improves Parkinson’s disease
Zhao Hong Yang

School “Health” in the lives of patients with Parkinson’s disease
Irina Zhukova, Maria Nikitina, Olga Izhboldina, Natalya Zhukova, Valentina Alifirova, Anna Agasheva, Alexey Povalyaev, Marina Titova

Care Delivery & Quality of Life: Disability and quality of life outcome measures

The impact of clinical symptoms on quality of life in patients with advanced stage Parkinson’s disease
Nina Browner, Lindsay Prizer, Amber Baxley, Jessica Katz

Quantifying the effect of deep brain electrical stimulation on postural behavior of patients with Parkinson’s disease, in the initial weeks post-surgery
Ines Cruz, Véronique Ferret-Sena, Catarina Godinho
P31.03 Motor dysfunction, quality of life, physical activity and life-space in advanced Parkinson's disease: what is the impact of STN DBS
Jean-François Deneault, Christian Duval, Sébastien Barbat-Artigas, Mylène Aubertin-Leheudre, Nicolas Jodoin, Michel Panisset, Abbas Sadikot

P31.04 The ParkinsonAtlas: transparency in medical practice variations in PD care in the Netherlands
Mariëtta Elmers, Pieter van den Haak, Martijn van der Eijk, Bastiaan Bloem, Marten Munneke

P31.05 Comparison of the psychological symptoms and disease-specific quality of life (QoL) between early- versus late-onset Parkinson’s disease patients
Seyed Mohammad Fereshtehnejad, Mahdyeh Shafiee Sabet, Farzaneh Farhadi, Hasti Hadizadeh, Dena Khaefpanah, Nader Naderi, Arash Rahmani, Ahmad Delbari, Gholam Ali Shahidi, Johan Lökk

P31.06 The effect of disease severity on postural control behavior in Parkinson Disease
Catarina Godinho, Véronique Ferret-Sena, José Brito, Margarida Dias, Ana Calado, Cristina Semedo, Josefa Domingos, Filipe Melo

P31.07 Neuropsychiatric symptoms impact quality of life and caregiver burden in Mexican population with Parkinson’s Disease
Paulina Gonzalez-Latapi, Azyadeh Camacho-Ordoñez, Mayela Rodriguez-Violante, Amin Cervantes-Arriaga, Pablo Martinez-Martín

P31.08 Factors, disabling patients on the early stages of Parkinson's disease
Ekaterina Gubanova, Nataliya Fedorova

P31.09 Quality of life in Parkinson’s disease patients with motor fluctuations and dyskinesias in five European countries
Marlene Hechtner, Thomas Vogt, York Zöllner, Julia Sauer, Maria Blettner, Harald Binder, Susanne Singer, Rafael Mikolajczyk

P31.10 Club CREATE- A program to improve quality of life for late-stage Parkinson’s disease
Joan Hlas

P31.12 Does home-visiting improve quality of life of those living with Parkinson’s disease living in rural areas? – a program evaluation
Tanis Robinson, Beth Metcalf

P31.13 Quality of life and the relative importance of motor and non-motor symptoms in Parkinson’s: the patient perspective
Jon Stamford, Parkinson’s Movement

P31.14 Patient-centered care in the Parkinson centers of excellence: a multicenter study
Martijn van der Eijk, Marjan Faber, Peter Schmidt, Marten Munneke, Michael Okun, Bastiaan Bloem

Care Delivery & Quality of Life: Palliative Care/End of Life Care/Long-term care

P33.01 Improving End of Life Care in Parkinson's disease
Apurba Chatterjee, Elizabeth Bradburn, Jordan Bowen, Claire Sin-Hidge, Paul Howard, Susi Lund, Qurat Malik

P33.02 End of life experience in Parkinson's disease and movement disorders from the caregiver perspective
Ruth Hagestuen, Martha Nance, Catherine Wielinski

P33.03 Struthers Parkinson's Care Network
Ruth Hagestuen, Rosemary Wichmann, Joan Gardner

Care Delivery & Quality of Life: Daily life activities including working & driving

P35.01 Freezing of gait symptoms in Parkinson’s impairs vision for perception but not action: evidence from gait with obstacles
Frederico Faria, Kaylena Martens, Carolina Silvera, Jeffery Jones, Quincy Almeida

P35.02 The experience of motor and non-motor symptoms during daily life with Parkinson’s disease
Shih-yu Lur, Linda Tickle-Degnen

P35.03 Working with Parkinson’s disease: extent and nature of problems and adaptations
Ingrid Sturkenboom, Maaike Storm van ’s Gravesande, Ronald Meijer

P35.04 Utilization of occupational therapy in management of impairments in Parkinson’s disease
Richard VandenDolder, Catherine Wielinski, Lori McManus
Care Delivery & Quality of Life: Self-management, empowerment, coping strategies

P36.15  Self-monitoring in Parkinson’s disease – exploring traveling over multiple time-zones
  Sara Riggare

Care Delivery & Quality of Life: Pharmacist, social worker & nonprofit team members

P37.01  Multidisciplinary care in professional networks for Parkinson’s disease
  Martijn van der Eijk, Marten Munneke, Frouke Nijhuis, Jan Koetsenruiter, Hubertus J. M. Vrijhoef, Bastiaan Bloem, Michel Wensing, Marjan Faber

Clinical Sciences: Progression & Prognosis

P13.02  Clinical Outcomes in patients with Parkinson disease treated with an MAO-B inhibitor
  Khashayar Dashtipour, Mahmood Gham szy, Jack Chen, Erin White, Pejman Dalai

P13.03  Rapid Disease Progression in Adult-Onset Mitochondrial Membrane Protein Associated Neurodegeneration
  Okan Dogu, Catharine E. Krebs, Hakan Kaleagasi, Zafer Demirtas, Nevra Oksuz, Ruth H. Walker, Coro Paisán-Ruiz

P13.04  Clinical Subtypes in Parkinson’s Disease associated with Dysphagia : Comparison of drug naive de novo stages with advanced stages after videofluoroscopic evaluation
  Matthias Hahne, Dietrich Hartmann, Rudbach Elisabeth, Bernd Griewling, Wolfgang Jost, Heinz Reichmann

P13.05  Motor, cognitive and affective characteristics of new-fallers compared to non-fallers in an incident cohort of Parkinson’s disease
  Lynn Rochester, Brook Galna, Sue Lord, Dadi rayi Mhiri piri, David Burn

P13.06  Gait predicts decline in attention over 18 months in an incident cohort of Parkinson’s disease
  Lynn Rochester, Sue Lord, Brook Galna, Tien Khoo, Gordon Duncan, Alison Yarnall, Dadi rayi Mhiri piri, David Burn

P13.07  The SURE-PD trial: Safety, tolerability and urate-elevating efficacy of inosine in Parkinson’s disease
  SURE-PD Investigators of the Parkinson Study Group, Michael Schwarzschild

Clinical Sciences: Cognition/Mood/Memory

P15.01  Personality and depression: Factors that influence reported quality of life among PD patients
  Susan Bassett, Zoltan Mari, Greg ori Pontone

P15.02  Impact of Parkinson’s disease on social role function: Multi-faceted disability
  Susan Bassett, Greg ori Pontone, Zoltan Mari

P15.03  A new paradigm in neuropsychological assessment: Motor Imagery. A pilot Study with Parkinson’s disease patients
  Evangelina Valeria Cores, Sandra Vanotti, Angeles Merino, Sergio Rodriguez Quiroga, Tomoko Arakaki, Nélida Garreto

P15.05  Interactions between cognition, depression and L-Dopa in Parkinson’s disease
  Clotilde Degroot, Marie-Andrée Bruneau, Béatrice Mejia-Con stain, Christophe Bedetti, Oury Monchi

P15.06  Relationships between motor, cognitive and psychological outcomes following bilateral subthalamic nucleus deep brain stimulation (STN-DBS) in patients with Parkinson’s disease
  Jelena Djordjevic, Maria Fraraccio, Michel Panisset, Abbas Sadikot

P15.07  The impact of treatment response to cognitive-behavioral therapy on different clusters of depressive symptoms in Parkinson’s disease
  Roseanne Dobkin, Michael Gara, Margery Mark, Matthew Menza

P15.09  Mild Cognitive Impairment in Parkinson’s Disease is linked with Extensive Cortical Thinning during Longitudinal Analysis
  Alexandru Hanganu, Christophe Bedetti, Clotilde Degroot, Béatrice Mejia-Con stain, Anne-Louis Lafontaine, Sylvain Chouinard, Oury Monchi
**Clinical Sciences: Diagnosis (differential, accuracy)**

**P17.01** Clinical correlates of vascular parkinsonism  

**P17.02** An investigation of the relationship between clinically-assessed and self-reported measures of side affected in patients with Parkinson’s disease  
*Elise Bisson*, Quincy Almeida, Joan Norris

**P17.03** Neuropsychological testing for the detection of mild cognitive impairment in Parkinson’s disease  
*Roberta Biundo*, Luca Weis, Silvia Facchini, Manuela Pilleri, Patrizia Formento-Dojot, Angelo Antonini

**P17.04** Development and Implementation of a Next Generation Sequencing Platform for Hereditary Parkinson Disease  
*Matthew Bower*, Bharat Thyagarajan, Kenny Beckman, Kevin Silverstein, Getiria Onsongo, Matthew Schomaker, Paul Tuile
Kinematic and kinetic continuous measurement of hand tremor to discriminate Parkinson’s disease: a pilot single-case study
Seyed Mohammad Fereshtehnejad, Ali Soroursh, Wim Grooten, Johan Lökk

DaTscan™ for Prediction of Clinical Diagnosis of Early Parkinsonian Syndromes: Sensitivity, Specificity, Positive and Negative Predictive Values, and Diagnostic Accuracy in Clinically Uncertain Cases
Robert A. Hauser, Igor D. Grachev, John Seibyl, Kenneth Marek, Andreas Kupsch, Michail Plotkin, Nin Bajaj

Posturography in differential diagnosis of patients with vascular Parkinsonism
Geun-Ho Lee

Targeted next-generation sequencing for Parkinson’s disease
Michelle Lin, Daniel Evans, Chelsea Szu Tu, Holly Sherman, Frederick Pishotta, Heather Han, Vanessa Silva, Christina Thompson, Ian MacKenzie, Viera Saly, Joseph Tsui, Martin McKeown, Carles Vilarrino-Guell, Alex Rajput, Ali Rajput, Silke Appel-Cresswell, A. Jon Stoessl, Matthew Farrer

Oro-digital synkinesia in corticobasal degeneration
Narges Moghimi, Bahman Jabbari

Auto-segmentation and evaluation of daily mobility tasks: whole-body kinematic assessment in Parkinson patients and elderly adults
Fariborz Bahimi, Lynn Zhu, Margaux Blamouliet, Catherine Lavigne-Pelletier, Mandar Jog, Patrick Boissy, Christian Duval

Late-onset hepatolenticular degeneration presenting as Parkinson’s disease
Maja Relja, Vladimir Miletic

MBG scintigraphy and a predictive role in clinically uncertain Parkinsonism
Anna Sauerbier, Nikolay Dimitrov, Riddhika Chakravarty, Nicola Mulholland, Gill Vivian, K Ray Chaudhuri

Usefulness of (123 I)-FP-CIT SPECT (DaT Scan) in diagnosing drug-induced Parkinsonism (DIP): a retrospective study
Anwar Ahmed

Effect of Dopamine Receptor Binding Agents on Dopamine Transporter (DaT) Scan Result
Anwar Ahmed, Srivadee Oravivattanakul, Lucas Benchaya, Illa Itin, Michal Gostkowski, Scott Cooper, Joseph Rudolph, Hubert Fernandez

A large Turkish Parkinson Pedigree with alpha-Synuclein Duplication: Blood Expression Biomarkers elucidate predictive Diagnostics and Pathway
Georg Auburger, Suna Lahut, Özgür Ömür, Suzana Gispert, Caroline Pirkevi, Hülya Tireli, Nadine Brehm, Karl Hackmann, Evelin Schroeck, Nazli Basak

A Novel Blood-Brain Barrier Permeable PET Ligand for Parkinson’s Disease
Anna Cartier, Ram Bhatt

Longitudinal striatal atrophy during Parkinson’s progression
Guangwei Du, Mechelle Lewis, Zeinab Nasralah, Nicholas Sterling, Christopher Dimaio, Lan Kong, Martin Styner, Xuemei Huang

A promising preclinical biomarker for Parkinson’s disease based on ocular tremor: support from quantitative DaTscan analysis
George Gitchel, Paul Wetzel, Shekar Raman, James Tatum, Mark Baron

Metabolic changes associated L-DOPA induced dyskinesia in a MPTP primate model of Parkinson’s disease and the effect of DHA or plasmalogon precursor administration
Dayan Goodenowe, Tara Smith, Vijitha Senanayake, Thérèse Di Paolo, Laurent Grégoire

Safety of DaTscan™ (Ioflupane I 123 Injection), a radiopharmaceutical indicated for visualization of the striatal dopamine transporter in the brain using SPECT imaging
Igor D. Grachev, Paul Sherwin, Duncan Lane, Rick Jarecke, Christel Zeisse, Emilio Moreno, Jeff Freid, Donald G. Grosset, Nin Bajaj, Robert A. Hauser, John Seibyl, Kenneth Marek

Cortical and subcortical brain volumes and clinical correlates in preclinical and clinical Parkinsonism
Lalitha Guthikonda, Stuart Red, Annise Wilson, Anne Sereno, Saumil Patel, Brian Copeland, Richard Castriotta, Tim Ellmore, Mya Schless
POSTERS

P19.11 The National Institute of Neurological Disorders and Stroke Parkinson’s Disease Program Consortium
Katrina Gwinn, Clemens Scherzer, Marg Sutherland, Beth-Anne Sieber, Deb Babcock

P19.12 Multi-modal Imaging Study of Posterior Cingulate in Parkinson’s Disease
Chaozhi Huang, Jonathan Dyke, Henning Voss, Apostolos Tsirouls, Claire Henchcliffe, Panida Phoolnurak, Lawrence Severt, James Maniscalco, Lisa Ravlin, Ulja Solnes, Melissa Nirenberg

Matilde Inglese, Roxana Teodorescu, Kristina Simoyan, Maria Petracca, Clara Moisello, Alessandro Di Rocco, Maria Felice Ghilardi

P19.14 Breath gas analysis for a potential diagnostic method of Parkinson’s disease
Pan-Woo Ko, Kyung-Hun Kang, Joon-Boo Yu, Jeong-Ok Lim, Ho-Won Lee

P19.16 Essential tremor has alterations in regional glucose metabolism and GABAergic system
Eunseok Oh, Jong-Min Kim, Hyun Woo Kwon, Yu Kyeong Kim, Byeong Seok Moon, Byeong Chul Lee, Sang Eun Kim

P19.17 Influence of Dopamine Transporter (DaT) scan on medical management in movement disorders specialists: Cleveland Clinic experience
Shyadee Oravivattanakul, Lucas Benchaya, Anwar Ahmed, Illa Itin, Michal Gostkowski, Scott Cooper, Joseph Rudolph, Hubert Fernandez

P19.18 Differences in striatal dopamine levels regarding predominant motor symptom in Parkinson’s disease
Maria Dolores Sevillano Garcia, Purificacion Cacabelos, Pilar Tamayo, Carlos Montes, Esperanza Perez, Enrique Martin

P19.19 Discrimination between patients with neurodegenerative syndromes with brain perfusion SPECT
Maja Trost, Petra Tomse, Marko Grmek, Milica Gregoric Kramberger, Zvezdan Pirtosek

Clinical Sciences: Surgical therapy, including cell and gene therapy

P21.02 Case report: transplantation of fetal porcine ventralmesencephalic cells (FPVMC) for Parkinson’s disease (PD): results and pathology
Samuel Ellias, Jeffrey Kordover

P21.03 Effects of bilateral stn-dbs on non-motor and axial symptoms in patients with Parkinson’s disease
Maria Fraraccio, Christiane Lepage, Thi Thanh Mai Pham, Elise Lafleur-Prud’homme, Abbas Sadikot, Nicolas Jodoin, Michel Panisset

P21.04 Long-term safety considerations of deep brain stimulation in treatment of Parkinson’s disease
Anna Gamaleya, Alexey Tomskiy, Ekaterina Bril, Andrey Dekopov, Anna Bondarenko, Svetlana Buklina, Nataliyia Fedorova, Vladimir Shabalov

P21.05 Intraoperative subthalamic microelectrode recording for deep brain stimulation in Parkinson’s disease
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LBP32 Achieving the impossible together
Bienvenue à Montréal!

Nous nous réjouissons de vous accueillir dans la belle ville de Montréal pour le Congrès mondial sur la maladie de Parkinson 2013. Nous espérons que vous profiterez de cette occasion pour explorer Montréal et découvrir la fébrilité du centre-ville, la diversité de l’architecture et la richesse de notre gastronomie.

Pour de l’inspiration sur quoi voir et quoi faire à Montréal, visitez www.tourisme-montreal.org

We are thrilled to welcome you to beautiful Montréal for the 2013 World Parkinson Congress. As you get together with colleagues, we hope you will take some time to explore Montréal and discover its exciting downtown vibe, diverse architecture and superb cuisine.

Find inspiration for things to see and do in Montréal on www.tourisme-montreal.org
Exhibition Schedule (Room 220CDE)

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The Parkinson’s Disease Foundation® (PDF®) supports the research and ideas that will improve the lives and futures of people touched by Parkinson’s. Since its founding in 1957, PDF has dedicated over $100 million to fund the work of leading scientists throughout the work and over $43 million to support national education and advocacy programs. For more information, visit www.pdf.org.

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INTERNATIONAL PARKINSON AND MOVEMENT DISORDER SOCIETY

555 East Wells Street, Suite 1100
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Tel: +1 414 276-2145
Fax: +1 414 276-3349
info@movementdisorders.org
www.movementdisorders.org

The International Parkinson and Movement Disorder Society (MDS) is a professional society of clinicians, scientists, and other healthcare professionals, who are interested in Parkinson’s disease, related neurodegenerative and neurodevelopmental disorders, hyperkinetic movement disorders, and abnormalities in muscle tone and motor control. Visit our exhibit booth to learn more about MDS education and membership.

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The American Parkinson Disease Association is the largest grassroots organization, whose mission is to “Ease the Burden – Find the Cure,” serves the 1.5 million Americans who have Parkinson disease and their caregivers by funding promising scientific research and providing support and education through a national network of 40 chapters, 50 Information and Referral chapters and more than 1,000 support groups.

APDM
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USA
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info@apdm.com
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APDM produces a sensor-based gait and balance analysis system called Mobility Lab. In under 5 minutes you can objectively measure your patient’s gait and balance and compare them to age matched norms, as well as baseline measurements. It is used in over 200 universities and hospitals around the world.

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Britannia Pharmaceuticals Limited is a UK based pharmaceutical company specializing in niche innovative products for chronic and serious medical conditions, and in particular, the treatment of patients with Parkinson’s disease. The need for apomorphine as a treatment option for Parkinson’s disease has led to the development of APO-go and other associated brands around the globe, which are available in many countries through our Distribution or Licensing Partners.

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Info@curepsp.org
www.curepsp.org

CurePSP is the foremost non-profit organization dedicated to increasing awareness of progressive supranuclear palsy (PSP), corticobasal degeneration (CBD), and other atypical Parkinsonian disorders; funding research toward treatment, cure and prevention; educating healthcare professionals; and providing support, information and hope for affected persons and their families.

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INTERNATIONAL PARKINSON AND MOVEMENT DISORDER SOCIETY
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555 East Wells Street, Suite 1100
Milwaukee, WI 53202
USA
Tel: +1 414 276-2145
Fax: +1 414 276-3349
info@movementdisorders.org
www.movementdisorders.org

The International Parkinson and Movement Disorder Society (MDS) is a professional society of clinicians, scientists, and other healthcare professionals, who are interested in Parkinson’s disease, related neurodegenerative and neurodevelopmental disorders, hyperkinetic movement disorders, and abnormalities in muscle tone and motor control. Visit our exhibit booth to learn more about MDS education and membership.

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NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE
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USA
Tel: +1 800 352-9424 | +1 301 496-5751
Fax: +1 301 402-2186
braininfo@ninds.nih.gov
www.ninds.nih.gov

The National Institute of Neurological Disorders and Stroke (NINDS) provides information about available research support and offers free publications for patients and their families on Parkinson’s disease and related disorders. Members of the NINDS staff will be available to assist you. Printed material will be available.
**NATIONAL PARKINSON FOUNDATION**

Booth #1507

Miami, Florida  
USA  
Tel: +1 800 473-4636  
helpline@parkinson.org  
www.parkinson.org

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**NEUROLOGICAL HEALTH CHARITIES CANADA**

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Canada  
Tel: +1 416 227-9700 ext 3476  
Fax: +1 416 227-9600  
info@mybrainmatters.ca  
www.mybrainmatters.ca

Neurological Health Charities Canada (NHCC) is a collective of 25 national Canadian brain organizations that represent people with chronic, often progressive, neurological and/or neuromuscular diseases, disorders, conditions and injuries in Canada. NHCC’s role is to provide leadership in evaluating and advancing new opportunities for collaboration specific to advocacy, education and research projects related to brain health.

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**PARKINSON ADVOCATES EXPERT CENTER**

Booth #1123

Hosted by WPC Parkinson Advocates Committee members, WPC Ambassadors, and Parkinson Movement Ambassadors. Join the Parkinson advocates community in this space to meet advocates from around the world. Find out how you can get involved and be inspired to make a difference.

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**PARKINSON SOCIETY CANADA – SOCIÉTÉ PARKINSON CANADA**

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Fax: +1 416 227-9600  
communications@parkinson.ca  
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Tucson, AZ 85716  
USA  
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Fax: +1 520 207-8331  
www.pwr4life.org

Parkinson Wellness Recovery (PWR!) is a nonprofit organization dedicated to implementing Exercise as Medicine. We envision communities where all individuals with Parkinson disease receive neuroplasticity-principled exercise programming beginning with diagnosis and throughout their lives in order to increase longevity and quality of life so that end stage Parkinson Disease is eradicated!
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ProtoKinetics offers the Mobilaser assistive device for individuals with Parkinsonism and movement analysis equipment for scientists and clinicians to assess the effectiveness of interventions and assistive technology. Quantify the Mobilaser’s ability to reduce shuffling and freezing of gait through the pressure, temporal and spatial data collected on the ProtoKinetics Gait Analysis Walkway.

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We bring people with Parkinson’s, their carers and families together via our network of local groups, our website and free confidential helpline. Specialist nurses and staff provide information and training on every aspect of Parkinson’s. As the UK’s Parkinson’s support and research charity we’re leading the work to find a cure. We also campaign to change attitudes and demand better services.

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We’re ‘fighting back’ against Parkinson’s disease! As the first gym dedicated to intense, non-contact, boxing-inspired fitness regimens proven to delay, reduce and reverse symptoms, we have affiliate programs throughout the world. Stop by for a demonstration and information about bringing Rock Steady Boxing to your community.

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infos@parkinsonquebec.com  
www.parkinsonquebec.ca  

The Parkinson Society Quebec in partnership with its 10 regional societies, are at the forefront of research and the development of services for Parkinson’s disease by providing information, support and advocacy as well as by their implications with the Quebec Research Fund for Parkinson’s.

La Société Parkinson du Québec en partenariat avec les dix sociétés Parkinson régionales agit comme leader de la recherche et du développement des services par l’information, le soutien, la défense des droits et son Fonds québécois de recherche sur le Parkinson.
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The Society of Nuclear Medicine and Molecular Imaging is committed to providing the community with information about nuclear medicine and molecular imaging and how it can play a critical role in the detection, treatment and management of diseases. Stop by our booth for free pamphlets on molecular imaging and brain disorders.

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SpeechVive is a behind the ear smart device which helps people with Parkinson’s disease speak louder and communicate more effectively. Clinical data over 4 years demonstrated SpeechVive to be effective in 90% of people using the device. Come by booth 1204 for a demonstration.

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Trager® work to benefit PwP’s, care partners and caregivers. Simple techniques for daily use to address rigidity and stiffness, improve stability and balance, increase mobility and flexibility, ease, awareness and fluidity of movement. Information/demonstration: hands-on work and self-directed movement protocols. Trager Practitioners experienced with Parkinson’s from Trager Canada, Trager Québec, and United States Trager Association.

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Established by Jay and Betty Van Andel in 1996, Van Andel Institute is an independent research and educational organization based in Grand Rapids, Mich. Through biomedical research and science education, Van Andel Institute is committed to improving the health and enhancing the lives of current and future generations.
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| | <strong><a href="http://www.parkinsonalberta.ca">www.parkinsonalberta.ca</a></strong> |</p>
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**GE Healthcare**

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To learn more about GE Healthcare's focus on parkinsonian syndromes, visit us at Booth #1301, or contact your GE Healthcare sales representative.

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August 2013    72-JB15969US    Printed in USA
**Acetylcholine:** One of the chemical neurotransmitters in the brain and other areas of the central and peripheral nervous system. It is highly concentrated in the basal ganglia, where it influences movement. It is located in other regions of the brain as well, and plays a role in memory. Drugs that block acetylcholine receptors (so-called anticholinergics) are utilized in the treatment of PD.

**Agonists:** A chemical or drug that can activate a neurotransmitter receptor. Dopamine agonists, such as pramipexole, ropinirole, bromocriptine and apomorphine, are used in the treatment of PD.

**Akinesia:** Literally, means loss of movement. It is usually interchangeable with bradykinesia (see below).

**Alpha-synuclein:** A protein present in nerve terminals. The accumulation of this protein is a pathologic finding in PD. The gene (SNCA) was the first genetic mutation found in PD, and was called PARK1. Alpha-synuclein also accumulates in multiple system atrophy (MSA) and in Lewy Body Disease. Alpha-synuclein appears to play a key role in the pathogenesis of PD.

**Amantadine:** A medication used to treat Parkinson’s disease as a single therapy or with L-DOPA and other medications. It has both an anti-Parkinson’s effect and an anti-dyskinesia effect.

**Amygdala:** An almond-shaped nucleus located deep in the brain’s medial temporal lobe in animals. It is involved in fear and anxiety responses, in particular in the formation of memories involving emotion.

**Anticholinergics:** A type of medication that interferes with the action of acetylcholine (see above). Examples include:
- benztropine mesylate
- biperiden hydrochloride
- orphenadrine citrate
- procyclidine hydrochloride
- trihexyphenidyl hydrochloride.

**Antagonists:** Has the opposite effect from an agonist (see above). Antagonists block neurotransmitter receptors. Dopamine antagonists can worsen Parkinson’s symptoms and can cause drug-induced Parkinsonism. Virtually all antipsychotic drugs have dopamine antagonist action.

**Ataxia:** Inability to coordinate voluntary muscle movements; unsteady movements and staggering gait.

**ATP13A2 (PARK 9):** A gene that codes for a form of the ATPase enzyme. When mutated, this gene may cause a form of early onset Parkinson’s.

**Autonomic Nervous System (ANS):** Part of the peripheral nervous system, consisting of sympathetic and parasympathetic nerves that control involuntary actions, in particular the heart, smooth muscle (such as bladder and blood vessels) and glands.

**Autosomal:** Refers to all the chromosomes excluding the sex-related X and Y chromosomes.

**Autosomal recessive:** A mode of inheritance of genetic traits located on the autosomes that only becomes manifest when two copies of a mutated gene (two alleles) are present. In order for a particular trait to be expressed, both parents must have the particular mutated allele or gene, and both must pass it to the offspring who then manifests the genetic disease. Some genetic forms of PD are autosomal recessive, such as from the genes known as parkin, PINK1 and DJ1. In some cases, the gene of interest is missing. In others, there are abnormalities and if 2 different abnormalities of the same are inherited, that can result in recessive inheritance.

**Axon:** A nerve fiber that carries electrical impulses from the nerve cell body to other neurons. Thick axons tend to be through the brain and spinal cord; they are surrounded by a protective fatty sheath called myelin (in multiple sclerosis the myelin is damaged). Thin axons tend to be unmyelinated. In PD, alpha-synuclein (see above) is deposited in long, thin axons, and these are called Lewy neurites.

**Basal ganglia:** Clusters of neurons that include the caudate nucleus, putamen, globus pallidus and substantia nigra which are located deep in the brain and play an important role in movement. Cell death in the substantia nigra contributes to Parkinsonian signs.

**Biomarker:** An early indicator that a person may have a disease, such as Parkinson’s. A biomarker, if present, could indicate that the person has a disease before symptoms of that disease appear. There is a search for biomarkers for PD. Biomarkers could be a chemical, clinical, physiologic or imaging finding.

**Blood brain barrier:** The separating membrane between the blood and the brain; a tight physical barrier that normally keeps immune cells, chemicals and drugs out of the brain.

**Bradykinesia:** Literally, means slowness of movement. It is commonly used synonymously with akinesia and hypokinesia. Bradykinesia is a clinical hallmark of Parkinsonism.

**Brain stem:** The part of the brain between the cerebral hemispheres and the spinal cord. The three parts of the brain stem are the medulla oblongata, pons, and midbrain. The brain stem is a vital structure that is a passageway between the brain and spinal cord, and it contains neurons involved in sleep and wakefulness. The substantia nigra, which is damaged in Parkinson’s, is located in the midbrain of the brain stem.
Calcium: An essential mineral. Calcium is important for neurological ‘signaling’ and is involved in many chemical reactions within neurons and in mitochondria function. Calcium overload in substantia nigra has been postulated as one mechanism that could contribute to death of these neurons.

Carbidopa: A drug given with levodopa. Carbidopa blocks the enzyme dopa decarboxylase, thereby preventing levodopa from being metabolized to dopamine. Because carbidopa does not penetrate the blood brain barrier (see above), it only blocks levodopa metabolism in the peripheral tissues and not in the brain, thereby reducing side effects but increasing the effectiveness of levodopa.

Caudate nucleus: A nucleus located in the basal ganglia important in learning and memory. It is one component of the basal ganglia called the striatum. The other component is the putamen.

Cerebellum: Part of the hind brain; controls smooth movements. When damaged, it results in ataxia (see above).

Cerebrospinal fluid (CSF): A watery fluid generated within the brain’s ventricles and circulates to bathe the brain and spinal cord to cushion these from physical impact.

Chronic: (opposite: acute) Chronic diseases are of long duration. Chronic diseases are typically of subtle onset and slow worsening over time. The term does not imply anything about the severity of a disease.

CNS: abbreviation of Central Nervous System, which consists of the brain, brain stem and spinal cord.

Cognition: Mental processes including attention, remembering, producing and understanding language, solving problems and making decisions.

Cognitive: Relating to mental activity such as thinking, reasoning, making judgments and remembering.

Computed tomography (CT): A medical imaging method employing computer processing to produce images seen as slices through the tissue. This presentation of images is known as tomography.

COMT (catechol-O-methyltransferase): One of the enzymes that break down dopamine, adrenaline (also called epinephrine) and noradrenaline (also called norepinephrine).

Continuous Dopaminergic Stimulation (CDS): A therapeutic concept for the management of Parkinson’s disease that proposes that continuous (as opposed to discontinuous or pulsatile) stimulation of striatal dopamine receptors will delay or prevent the onset of levodopa-related motor complications.

Cytokines: A number of small proteins that are secreted by specific cells of the immune system and carry signals locally between cells, and thus have an effect on other cells. Higher levels of pro-inflammatory cytokines are found in Parkinson’s brains. Unlike growth factors, they have no specific role in cell proliferation and are primarily linked to blood and immune cells. Cytokines have also been known to be involved in causing cell death.

Deep Brain Stimulation (DBS): A surgical treatment that involves the implantation of a medical device (electrical stimulator) that acts as a brain pacemaker sending electrical impulses to the specific area in which the electrode was inserted. In Parkinson’s patients the device is typically inserted in either the subthalamic nucleus or the globus pallidus, less often in the thalamus or pedunculopontine nucleus, depending upon the specific problem.

Dementia: A decline in cognitive function due to damage or disease in the brain beyond what might be expected from normal aging. Areas particularly affected include memory, attention, judgment, language, planning and problem solving.

• Alzheimer’s disease dementia: The most common form of dementia, typically presents with difficulty in remembering names and events. May also initially include apathy and depression, and later impaired judgment, disorientation, confusion, behavior changes and difficulty speaking, swallowing and walking. Associated with abnormal deposits of the protein fragment beta-amyloid (plaques) and twisted strands of the protein tau (tangles) as well as brain nerve cell damage and death.

• Dementia with Lewy bodies (DLB): Similar, but not identical, symptoms as in Alzheimer’s dementia. DLB commonly has a greater occurrence of sleep disturbances, well-formed visual hallucinations, and muscle rigidity. Associated with aggregation of alpha-synuclein in the cerebral cortex. Lewy bodies are also a pathologic hallmark in Parkinson’s disease. The relationship of DLB and PD remains to be resolved.

• Parkinson’s dementia: Presents similarly to Alzheimer’s dementia or dementia with Lewy bodies, but is typically preceded by clinical Parkinson’s disease. Associated with alpha-synuclein aggregates that are more likely begin in the brain stem, including the substantia nigra.

Dendrites: (from Greek meaning, ‘tree’) Nerve fibers that project from the nerve cell body. Branches of dendrites are the receiving fibers of signals coming to the neuron from other neurons and convert these chemical signals into electrical ones to the nerve cell body.

Depression: A state of low mood. Some consider it a dysfunction, while others see it as an adaptive defense mechanism.
**DJ-1**: Mutations in this gene cause an autosomal recessive form of Parkinson’s disease. The function of the protein created by DJ-1 appears to reduce oxidative stress.

**Dopa decarboxylase inhibitors**: Drugs (such as carbidopa) that inhibit the metabolism of levodopa to form dopamine. By inhibiting dopa decarboxylase only in the peripheral organs (not CNS), levodopa concentration is increased and more can enter the brain. These drugs are particularly useful in Parkinson’s when used with levodopa.

**Dopamine**: A small chemical molecule that is one of the brain’s neurotransmitters. It is found particularly in cells within the substantia nigra. These cells project to the striatum in the basal ganglia. Deficiency of dopamine causes symptoms of Parkinsonism.

**Dopamine agonist**: A compound that activates dopamine receptors, other than dopamine. Examples include, bromocriptine mesylate (Parlodol), pergolide (Permax), pramipexole (Mirapex), ropinirole hydrochloride (Requip), piribedil, cabergoline, apomorphine (Apokyn), rotigotine (Neupro patch) and lisuride. These act like dopamine, but are not actually dopamine. They can be used in both the early and late stages of Parkinson’s disease. They are the second most powerful type of anti-Parkinson medication after levodopa. They can cause side effects such as sleepiness, sleep attacks, ankle swelling, hallucinations and impulse control problems, more commonly than levodopa does.

**Dopaminergic pathways**: Neural pathways in the brain which utilize dopamine as their neurotransmitter. There are four major groups: the nigrostriatal, mesocortical, mesolimbic and tuberoinfundibular pathways.

- **Nigrostriatal**: Connects the substantia nigra to the striatum. Involved heavily in Parkinson’s.
- **Mesocortical**: Connects the ventral tegmental area (adjacent to the substantia nigra) to the cerebral cortex. Closely associated with the mesolimbic pathway.
- **Mesolimbic**: Connects ventral tegmental area to nucleus accumbens, amygdala & hippocampus and prefrontal cortex. Along with the mesocortical pathway, is involved in memory, motivation, emotional response, reward and addiction. Can cause hallucinations and schizophrenia if not functioning properly.
- **Tuberoinfundibular**: from hypothalamus to pituitary gland involved in hormonal regulation, maternal behavior (nurturing), pregnancy and sensory processes.

**Dysarthria**: Impaired speech function.

**Dyskinesia**: Abnormal involuntary movements; hyperkinesia.

**Dysphagia**: Difficulty in swallowing.

**Embryonic stem (ES) cells**: See stem cells

**Entacapone**: A Parkinson’s drug that is used alongside levodopa and carbidopa. It inhibits the enzyme COMT, decreasing the breakdown of levodopa.

**Festination**: An involuntary quickening of the gait; the acceleration of gait noted in Parkinsonism and similar disorders, literally means “chasing the center of gravity”.

**Functional magnetic resonance imaging (fMRI)**: An imaging technique designed specifically for the brain. It measures the rate at which oxygen is removed from the blood to the cells, therefore suggesting the activity of a particular area of the brain.

**GABA (gamma amino butyric acid)**: The principal inhibitory neurotransmitter in human brain. GABA neurons are rich in the striatum, globus pallidus, substantia nigra and cerebellum.

**GDNF**: See growth factors

**Gene therapy**: The insertion of genes into an individual’s cells and tissues to treat hereditary diseases where deleterious mutant alleles can be replaced with functional ones. The genes are usually placed within a non-pathogenic virus, which serves as the vector to penetrate the cells. Gene therapy can also be used to correct non-genetic deficiencies such as the loss of dopamine in Parkinson’s, to modify the function of a group of cells (e.g. convert an excitatory structure to one that is inhibitory) or to provide a source of growth factors.

**Genotype**: The collection of genetic material in an organism that gives rise to its characteristics.

**Glia (Glia cells)**: Non-neural cells, commonly called neuroglia or simply glia (Greek for “glue”), that maintain homeostasis, form myelin, and provide support and protection for the brain’s neurons.

**Globus pallidus**: A major part of the basal ganglia involved in movement control. Split into two main parts: the internal globus pallidus (GPI), and the external globus pallidus (GPe). Deep brain stimulation of the GPI is shown to have an increase in motor function in Parkinson’s patients and to reduce dyskinesia.

**Glutamate**: An amino acid and the main excitatory neurotransmitter in the human brain. The major input to the striatum is from the cerebral cortex. These corticostriatal neurons use glutamate as their neurotransmitter.

**Growth factors**: Naturally occurring substances (usually proteins) that help maintain the health of neurons and encourage cell growth, proliferation and differentiation. Some growth factors are being looked at to try to promote the survival of the neural cells that are degenerating in Parkinson’s.

- **Glia cell line derived nerve growth factor (GDNF)**: Thought to promote the health of dopamine neurons.
- **Brain-derived nerve growth factor (BDNF)**: Also supports dopamine neurons.
- **Fibroblast growth factor (FGF)**: Studies have found a possible genetic link to Parkinson’s disease on the FGF20 gene.
- **Vascular endothelial growth factor-B (VEGF-B)**: May have neuroprotective affects in Parkinson’s disease.
Heterogeneity: Lacking uniformity in composition or character. (As opposed to homogeneity, which is uniformity in composition or character.)

Hippocampus: A complex neural structure (shaped like a sea horse) located in the temporal lobes of the brain; involved in memory storage and in motivation and emotion as part of the limbic system.

Hoehn and Yahr scale: A commonly used system for describing how the symptoms of Parkinson's disease progress. The higher the stage, the more advanced the disease. - Stage 0: No signs of disease.
- Stage 1: Unilateral symptoms only.
- Stage 1.5: Unilateral and axial (midline) involvement.
- Stage 2: Bilateral symptoms. No impairment of balance.
- Stage 2.5: Mild bilateral disease with recovery on pull test.
- Stage 4: Severe disability, but still able to walk or stand unassisted.
- Stage 5: Needing a wheelchair or bedridden unless assisted.

Hyperkinesia: An abnormal increase in movement and/or muscle activity; synonymous with dyskinesia.

Hypokinesia: Literally means reduced amplitude of movement. It is commonly used synonymously with akinesia and bradykinesia.

Hypothalamic pituitary adrenal axis (HPA): The three primary components of the endocrine system. Made up of the hypothalamus, pituitary gland and the adrenal cortex, the HPA has a wide range of functions from stimulating the stress response to control of digestion, the immune system, mood, sexuality and energy storage and consumption.

Hypothalamus: A portion at the bottom of the middle of the brain that links the limbic system to the pituitary gland and is a master area for the autonomic nervous system.

Idiopathic: Arising from an unknown cause.

Impulse control disorder (ICD): A set of psychiatric disorders characterized by an inability to control one's actions, in particular those that might bring harm to oneself or others. Common ICDs in patients receiving dopamine agonists are pathologic gambling, compulsive eating, compulsive shopping and hypersexuality.

Leucine rich repeat kinase 2 (LRRK2): A protein created by the LRRK2 gene which when mutated can lead to Parkinson's. Several different disease causing LRRK2 gene variants have been found in Parkinson's patients, but there may also be variants within the general population that do not necessarily cause disease.

Levodopa (L-DOPA): A chemical that is the precursor to dopamine. It can pass through the blood-brain barrier (whereas dopamine cannot). Once it has entered the central nervous system, L-dopa is converted into dopamine by aromatic L-amino acid decarboxylase (DOPA decarboxylase/DDC). L-DOPA is also converted into dopamine within the peripheral nervous system, but this is usually blocked by employing peripherally-active dopa decarboxylase inhibitors.

Lewy bodies: A pathologic hallmark of Parkinson’s disease and dementia with Lewy bodies. First described by Frederic Lewy, Lewy bodies are seen microscopically as inclusions in neurons in several brain regions, including the substantia nigra and locus ceruleus. One protein seen is alpha-synuclein in an aggregated form. Aggregates of this protein in axons are called Lewy neurites.

Magnetic resonance imaging (MRI): A noninvasive medical imaging technique to visualize detailed internal structure and limited function of the body. MRI provides much greater contrast between the different soft tissues of the body than computed tomography (CT), making it especially useful in neurological (brain), musculoskeletal, cardiovascular and oncological (cancer-related) imaging.

MAO (monoamine oxidase): A family of enzymes with two subtypes: MAO-A and MAO-B. These catalyze the oxidation of amine molecules (replacing the amine group with an oxygen molecule.)
- MAO A inhibitors: Drugs that inhibit the MAO-A enzyme, which is responsible for the metabolism of dietary tyramine. MAO-A inhibitors can cause tyramine-induced hypertension, the so-called “cheese effect” because tyramine can be found in high concentrations in some soft cultured cheeses.
- MAO B inhibitors: These drugs (e.g. selegiline, rasagiline) inhibit the breakdown of dopamine via MAO-B enzyme and do not cause the “cheese effect” of hypertension.

N-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP): A neurotoxin precursor of MPP+ that is taken up in dopamine nerve terminals. MPP+ damages the dopamine cells. MPTP is catalyzed to MPP+ by MAO-B. MPTP has been widely used to create an animal model of Parkinsonism by depleting substantia nigra dopamine neurons.

Microglia: A type of glial cell; it provides the first immune defense mechanism in the brain and central nervous system.

Motor skills: The degree of control or coordination provided by brain control of the skeletal muscles.

Motor symptoms: Symptoms that involve movement, coordination, physical tasks or mobility. These include, among others: resting tremor, bradykinesia, rigidity, postural instability, freezing, micrographia, mask-like expression, unwanted accelerations, stooped posture, dystonia, impaired motor dexterity and coordination, speech problems, difficulty swallowing, muscle cramping, and drooling of saliva. (Also see: non-motor symptoms)
Multiple System Atrophy (MSA): A less common degenerative neurological disorder that causes symptoms similar to Parkinson’s disease but with more widespread damage to the central nervous system. Other systems involved besides the basal ganglia include the cerebellum and autonomic systems.

Neuromelanin: The dark pigment made from oxidized metabolites of monoamine neurotransmitters including dopamine and norepinephrine, found in neurons enriched with these amines, namely the substantia nigra and locus ceruleus, respectively. Neuromelanin gives the substantia nigra (Latin for “black substance”) its black appearance.

Neuromodulator: A chemical substance other than a neurotransmitter, released by a neuron at a synapse and either enhances or dampens their activities.

Neuroprotection: Mechanisms within the nervous system that would protect neurons from dying due to a degenerative disease or from other types of injury.

Neurotransmitter: A chemical messenger in the nervous system that permits communication between two neuronal cells, normally across a synapse. The neurotransmitter is released from the nerve terminals on the axons. Examples of neurotransmitters include dopamine, acetylcholine, adrenaline, noradrenaline, serotonin, glutamate, and GABA.

Nicotine: A stimulant that acts as an agonist at nicotinic receptors in the brain. Smoking, which contains nicotine, has been associated with a decreased chance of developing Parkinson’s disease.

Non-motor symptoms: Symptoms that do not involve movement, coordination, physical tasks or mobility, including loss of sense of smell, constipation, sleep disorders or disturbances, mood disorders, orthostatic hypotension, bladder problems, sexual problems, excessive saliva, weight loss or gain, vision and dental problems, fatigue, depression, fear and anxiety, skin problems, and cognitive issues. (See motor symptoms)

On and Off: The clinical states of PD while being treated with levodopa, which commonly causes clinical fluctuations after a few years of treatment. The “on” state is when the PD symptoms and signs are reduced by levodopa. The “off” state is when the benefit has been reduced or lost. The most common type of “off” is wearing-off, due to the levodopa’s benefit not lasting more than 4 hours after a dose. Sudden and unpredictable “off” states can also occur, but are less common. “Off” states usually will respond to another dose of levodopa. Clinical fluctuations are considered a complication of levodopa therapy.

Orthostatic hypertension: A drop in blood pressure when a person is standing. It can be a complication of medications, but can sometimes be due to Parkinsonism itself.

Paradoxical kinesia: The ability to move as a response to an unexpected stimulus, occurring in a person who previously could not move so easily. Paradoxical kinesia can occur in Parkinson’s disease.

Parkin: A protein that is generated by the Parkin gene. With homozygous (both alleles affected) Parkin mutations (PARK2 gene), Parkinson’s disease develops. It is the most common cause of juvenile onset PD.

Parkinson-plus syndromes: A group of neurodegenerative diseases featuring the classical features of Parkinsonism (rigidity, akinesia/bradykinesia, postural instability and less commonly tremor) with additional features that distinguish them from typical Parkinson’s disease. Parkinson-plus syndromes include multiple system atrophy (MSA), progressive supranuclear palsy (PSP), and corticobasal degeneration (CBD).

Parkinsonism: A group of neurological diseases whose features include slowness and paucity of spontaneous movement (bradykinesia), rest tremors, rigidity of the muscles, loss of postural reflexes, flexed posture and freezing of gait.

Parkinsonian gait: With bradykinesia, gait is slow, short paced and with a tendency to shuffle, associated with decreased arm swing. Freezing of gait can also occur in Parkinsonism.

Pathogenesis: The underlying biologic mechanism responsible for a disease.

PINK-1: An abbreviation for the name of a gene that encodes serine/threonine kinase, an enzyme found in mitochondria that stops stress related cell destruction. With homozygous (both alleles affected) PINK−1 mutations, juvenile or early onset Parkinson’s disease can develop. Lack of PINK-1 causes an overload of calcium in mitochondria and indirectly cell death. The substantia nigra is shown to be particularly sensitive to PINK-1 mutations.

Placebo: A simulated or inert form of treatment without known proven benefit on a symptom or a disease. A pill serving as a placebo is colloquially called a “sugar pill.” When placebos provide benefit, it is called a placebo effect. Placebos are employed in controlled clinical trials along with the active drug being tested. The difference in responses between the two drugs is considered the true effect of the active drug. Surgical trials can also utilize a placebo arm in which sham or simulated surgery is performed in the control group. The mechanism of how placebos provide benefit may be associated with release of dopamine in the brain.

Positron emission tomography (PET): A medical imaging technique in which radioactive isotopes that emit gamma rays are used. The radioactive substance is incorporated into a chemically active compound (a radiotracer, which could be a substrate for an enzyme or a ligand that binds to neurotransmitter receptors) utilized by an organ in the body. The emitted gamma rays are detected by a special camera/scanner. These radioactive strikes on the camera are analyzed by a computer to produce an image to localize where that ligand is located in the organ being studied. Fluorodeoxyglucose (FDG) measures regional metabolism of glucose (sugar); fluorodopa (F-DOPA) is taken up in dopamine nerve terminals. The amount of uptake serves as a measure of the integrity of these nerve terminals. Other radiotracers may bind to neurotransmitter receptors (including those for dopamine) or to inflammatory cells etc.
Progressive Supranuclear Palsy (PSP): A rare degenerative brain disorder that causes serious and progressive problems with control of gait and balance, along with complex eye movement and thinking problems. A classic manifestation of the disease is the inability to move the eyes properly. PSP is one of the Parkinson-plus syndromes.

PwP: Person with Parkinson’s.

Reactive oxygen species (ROS): Chemically-reactive molecules containing oxygen that may trigger cell death. These are also called oxyradicals. These molecules are a cause of oxidative stress that may play a role in the pathogenesis of cell death of dopamine neurons. Oxyradicals are formed during regular cellular and mitochondrial metabolism. Defense mechanisms include naturally occurring reducing agents to neutralize the oxyradicals.

Receptor: A protein structure typically embedded in the cell membrane with which neurotransmitters and drugs interact.

REM (rapid eye movement) sleep behavior disorder (RBD): A sleep disorder that involves movement and abnormal behavior during the sleep phase with rapid eye movements – the stage of sleep in which dreaming occurs. In normal sleep, muscles are paralyzed during dreaming, except for the eye movements. In RBD, muscles are not paralyzed so that the dreamer acts out his or her dreams. RBD is common in people with Parkinson’s disease or MSA.

Restless leg syndrome (RLS): A neurological disorder characterized by unpleasant sensations in the legs, like the feeling of ants crawling underneath the skin. These sensations usually occur in the late evening and during sleep. Walking around relieves the sensation, hence the term “restless legs.” RLS interferes with sleep and is common in people with PD. Medications, such as dopamine agonists, levodopa and opioids, can be effective treatments.

Schwab and England Activities of Daily Living (ADL) Scale: An estimation of the abilities of a person’s degree of independence. The person (or a family member) can self-assess this as:

- 100% - Completely independent. Able to do all chores without slowness, difficulty or impairment.
- 90% - Completely independent. Able to do all chores with some slowness, difficulty or impairment. May take twice as long to complete.
- 80% - Independent in most chores. Takes twice as long. Conscious of difficulty and slowing.
- 70% - Not completely independent. More difficulty with chores. 3 to 4 times longer to complete chores for some. May take large part of day for chores.
- 60% - Some dependency. Can do most chores, but very slowly and with much effort. Errors, some impossible.
- 40% - Very dependent. Can assist with all chores but few alone.
- 30% - With effort, now and then does a few chores alone or begins alone. Much help needed.
- 20% - Nothing alone. Can do some slight help with some chores. Severe invalid state
- 10% - Totally dependent, helpless.
- 0% - Vegetative functions such as swallowing, bladder/bowel function are not functioning. Bedridden.

Serotonin: A neurotransmitter that regulates mood, appetite, and sleep. It also has some cognitive functions, including memory and learning. The serotonin-containing neurons are in the brain stem. Serotonin is reduced in PD.

Single photon emission computed tomography (SPECT): A nuclear medicine tomographic imaging technique using gamma rays and able to provide 3D information, for instance on brain chemistry.

Sleep apnea: A sleep disorder characterized by abnormal pauses in breathing or instances of abnormally low breathing during sleep.

Sodium channel: Voltage gated channels in nerve cell membranes that allow the generation of action potentials. Sodium ions are important in generating the electrical impulses that travel down the dendrites and axons. After sodium enters the cell during this process, it needs to be pumped back out, via the so-called sodium-pump, a process that requires the utilization of cellular energy. Sodium channels may be a target for new drugs in Parkinson’s.

Stem cells: Biological cells found in all multicellular organisms, that can divide (through mitosis) and differentiate into diverse specialized cell types and can self-renew to produce more stem cells. They are a potential line of treatment in Parkinson’s, either by directly replacing the old nigrostriatal neuronal cells or by creating growth factor releasing cells. Problems have arisen due to the inability to stop growth, which may cause tumor growth.

Striatum: A large cluster of nerve cells that are part of the basal ganglia. The striatum consists of two sectors: the caudate nucleus and the putamen. It controls movement, balance, and walking; the striatum receives nerve inputs from many parts of the brain including dopamine neurons from the substantia nigra and glutamate neurons from the cerebral cortex. Acetylcholine neurons are located within the striatum. The striatum contains the largest concentration of dopamine and acetylcholine in the brain.

Substantia nigra: (Latin for black substance). A brain structure located in the midbrain that plays an important role in reward, addiction, and movement. Parts of the substantia nigra appear darker than neighboring areas due to high levels of neuromelanin in dopaminergic neurons. The substantia nigra is the site of the brain’s major collection of dopamine neurons, which project their axons to the striatum, the so-called nigrostriatal pathway. These neurons slowly die in PD. The substantia nigra is part of the basal ganglia; the other parts of the basal ganglia include the striatum (caudate nucleus, putamen, and nucleus accumbens), globus pallidus, and subthalamic nucleus. The substantia nigra is made up of two parts: the pars compacta and the pars reticulata.

- Pars compacta: The part of the substantia nigra primarily involved in Parkinson’s. It contains dopamine neurons, and it is black due to the high concentration of neuromelanin within these neurons. (Parkinson’s disease is characterized by the death of dopaminergic neurons in the substantia nigra pars compacta.)


• Pars reticulata: Part of the substantia nigra that serves both as the location of dendrites from the pars compacta, receiving nerve signals to the substantia nigra and also as an output, conveying signals to numerous other brain structures. These output neurons are mainly GABAergic neurons.

Subthalamic nucleus (STN): A small lens-shaped nucleus involved in movement control. As suggested by its name, the subthalamic nucleus is located below the thalamus. It is part of the basal ganglia. It receives input from the cerebral cortex and from the globus pallidus interna. It sends its output mainly to the globus pallidus externa and interna. It is a component of the ‘indirect pathway’ within the basal ganglia. It is ‘overactive’ in PD due to loss of inhibitory incoming fibers. It is a common target in deep brain stimulation for PD.

Shuffling gait: Refers to short, slow steps, with feet close to the ground or dragging along the ground. This gait is often seen in people with advanced Parkinson’s disease.

Synapse: The narrow space between two neurons (axon to dendrite) or between a neuron and a muscle. Axons release neurotransmitters at the nerve terminal. The neurotransmitter crosses the synapse to activate or a receptor on the dendrite.

Synaptic plasticity: The ability of synaptic activity to modify and adapt to changes.

Syndrome: A group of symptoms that tend to occur together and which reflect the presence of a specific disorders or diseases. Parkinson syndrome, also called Parkinsonism, comprise a group of disorders with symptoms and signs in common, such as bradykinesia, rigidity, tremor, loss of postural reflexes, flexed posture and freezing of gait. A person with Parkinsonism does not need to have all of these but must have bradykinesia according to one diagnostic criterion. Disorders that fall within Parkinson syndrome include Parkinson’s disease, atypical Parkinsonism, drug-induced Parkinsonism, and normal pressure hydrocephalus.

Tau proteins: Proteins that stabilize microtubules. They are abundant in neurons in the central nervous system and are less common elsewhere. When tau proteins are defective, and no longer stabilize microtubules properly, they can result in dementia (including Alzheimer’s disease).

Tauopathies: A class of neurodegenerative diseases resulting from the pathological aggregation of tau protein in so-called neurofibrillary tangles (NFT) in the human brain. Besides Alzheimer’s, this is commonly seen in Pick’s disease, progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD).

Thalamus: A midline paired symmetrical structure situated between the cerebral cortex and brain stem, both in terms of location and neurological connections. It relays sensory signals to the cerebral cortex and motor signals from the cortex to the spinal cord and brain stem.

T.R.A.P.: Acronym for four primary Parkinson’s disease symptoms:
• Tremor: Shaking of limb (usually hands) while they are at rest.
• Rigidity: Muscle stiffness and resistance to movement.
• Akinesia/bradykinesia: Slow movement or difficulty initiating voluntary body movements; Slowed ability to start and continue movements.
• Postural instability: Loss of postural stability can cause falls and produce a feeling of unsteadiness.

Transcription factors: Proteins in eukaryotes (cells which contain complex membrane-bound structures within the cell) that regulate the transcription of genes.

Translation: A step in protein biosynthesis wherein the genetic code transferred from DNA to messenger RNA (mRNA) is decoded to allow the formation of a protein molecule. The process is preceded by transcription.

Tyramine-induced hypertension: High blood pressure caused by an increase in tyramine in the blood, which forces noradrenaline/norepinephrine out of vesicles and into circulation. This is the so-called ‘cheese effect’ because some fermented cheeses (and other foods) contain high concentrations of tyramine. Normally, tyramine is broken down in the gut by MAO-A. When this enzyme is inhibited, the tyramine in food is able to enter the blood stream and produce its hypertensive crisis

Ubiquitin: A small regulatory protein that is composed of 76 amino acids. It is involved in the degradation of damaged proteins. In Parkinson’s disease, it is believed that accumulation of damaged proteins ‘choke’ the cell leading to the eventual death of the cell.

Unified Parkinson’s Disease Rating Scale (UPDRS): A rating scale used to measure the severity of Parkinson’s disease. The UPDRS can follow a person’s worsening over time and also measure improvement with various treatments. The UPDRS is made up of the following sections:
• Part I: Evaluation of mentation, behavior, motivation and mood
• Part II: Self-evaluation of the activities of daily life (ADLs) including speech, swallowing, handwriting, dressing, hygiene, falling, salivating, turning in bed, walking, cutting food
• Part III: Clinician-scored motor evaluation
• Part IV: Measures some of the adverse effects (such as motor complications of ‘off’ states and dyskinesias) of levodopa therapy in Parkinson’s disease The UPDRS has been modified by the Movement Disorder Society to include more non-motor features of PD. This new version is called MDS-UPDRS.

Vesicle: An organelle in a cell that separates other molecules from the rest of the cell. In nerve terminals the vesicles are called synaptic vesicles. They store neurotransmitters, which are released into the synapse when the nerve fires.
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