Overview

• Brief intro to ICACSER
• Description of Teams:
  • Defining the regulatory landscape and needs
  • Bioinformatics toolbox development
• Volunteering for teams
Steering Committee

Established: March 2020
Chemicals make up the world around us – necessary for our modern society
Collectively protect human health and the environment
Motivation for ICACSER

- **Mutual goals** in translating science for regulatory use
- Eliminating or greatly **reducing the use of animals** in toxicology
- **Changing** regulatory landscape
  - Greater use of mechanistic, cell-based, and computationally derived information [New approach methods (NAMs)]
- Establish **confidence in mechanistic data** and provide evidence as to how it relates to apical level changes
  - Aid decision-makers in understanding **strengths and weaknesses for application**
    - Domain of applicability
- Establish **criteria/guidance for use** of NAMs
Need for Advances in Species Extrapolation

- Define the taxonomic domain of applicability in AOP development
- Use of historic toxicity data
- High-throughput transcriptomics
- High-throughput screening assays (ToxCast)

Knowledge of a few surrogates representing the diversity of species in the environment
Species Extrapolation

What is it?
• Using existing knowledge about one species to **estimate, predict, project, or infer** the effect, impact, or trajectory of another species
  • For chemical safety typically dealing with toxicity
The Challenge

TOXICOKINETICS
- Absorption
- Distribution
- Metabolism
- Elimination

TOXICODYNAMICS
- Target site conservation
- Pathway conservation

Bioinformatics
Systematic literature review
Toxicokinetics/toxicodynamics modeling
Bioinformatics

- Combines mathematics, information science, and biology to answer biological questions

- Developing methodology and analysis tools to explore large volumes of biological data
  - Query, extract, store, organize, systematize, annotate, visualize, mine, and interpret complex data
  - Usually pertains to DNA, RNA, and amino acid sequences

Let the computers do the work
Challenge of species extrapolation cannot be addressed in a silo:
ICACSER
Vision to Move Forward

Create Teams
• Global Regulatory Landscape
• Bioinformatics Toolbox Development
• Communicate a Shared Scientific Vision
Task Team: Global Regulatory Landscape
Supporting a policy and decision-making need

Objective:
Define the global regulatory landscape and the needs/ vision for exploiting cross species extrapolation of toxicity knowledge for supporting risk-based chemical safety decision making across both HH and the environment.
Task Team: Global Regulatory Landscape
Supporting a policy and decision-making need

Who?
All who are interested/have a vested interest. In particular:

• Government organisations
• Regulatory agencies
• Decision-makers
• Policy-makers
• NGOs with vested interest (e.g. NAT approaches)
• Organizations involved in developing standards/standard approaches, industry, professional societies (SETAC/SOT etc.)
• Academia with existing strong links with governmental organisations/ regulatory agencies etc.
Task Team: Global Regulatory Landscape
Supporting a policy and decision-making need

Why get involved?

• Development of approaches which are fit for purpose/will help address decision making challenges
• Helping drive acceptability/acceptance of NAMs (specifically cross species) supporting regulatory challenges.
• Publication
• Training opportunities
Task Team: Global Regulatory Landscape
Supporting a policy and decision-making need

What?

1. **Capture regulatory drivers and needs** to scope and define the scientific charge
   - Publication regarding needs and recommendations/ (roadmap)

2. **Engage champions within organizations to inform and guide consortium activities**
   - Define a focus to start as proof of principle (e.g., Endocrine Disruption)
   - Define agreed approach(es) for application for supporting chemical risk safety decisions (across Human Health and Environment)

3. **Case studies**
   - Identify and work with partners/ across team for case study proposal/ development to present to regulator partners (i.e., via Accelerating the Pace of Chemical Risk Assessment; APCRA)
Task Team: Global Regulatory Landscape
Supporting a policy and decision-making need

Year 1
- Collect information on regulatory needs/direction setting via mapping activities and survey of government based organisations/policy makers/regulators etc..
- Manuscript on regulatory/policy needs and recommendations (roadmap)

Year 2
- Complete manuscript.
- Identify and scope the needs for guidance and training; draft/develop as appropriate across teams (e.g. Bioinformatics Toolbox team).
- Develop regulatory relevant case studies across teams with Bioinformatics Toolbox team for sharing with Accelerating the Pace of Chemical Risk Assessment (APCRA).
- Lead sessions/present at sessions at professional societies (cross team: i.e. Bioinformatics toolbox etc.)

Years 3&4
Cross team working - Criteria/Guidance document; Communication, training, and outreach continued; Workshop(s); publication(s) etc..
Continued engagement with policy makers/regulatory/government organisations etc..
Take home messages: Global Regulatory Landscape and Needs for Extrapolation

• Identify **current needs in regulation** and the **future opportunities**
• **Publication and case studies**
• Identify **training/guidance/ communication needs**
• **Engaging decision-makers** in development from the start
• Define **recommendations/ roadmap for integration** into regulation
  • OECD guidelines
Task Team: Bioinformatics Toolbox Development
The right tools for the job

**Objective:**
Through collaborative discussions and partnership develop tangible actions toward the delivery of a bioinformatics toolbox that integrates data-streams for consistent interpretation in understanding cross species extrapolation of toxicity knowledge in a One Health (Human Health and Environment) context. The toolbox is intended to serve as a resource for integration in mainstream practices for species extrapolation used in global regulatory decision-making.
Task Team: Bioinformatics Toolbox Development
The right tools for the job

Who:
Developers
Product owners
Architects of the approaches/methods
Authors of published tools/databases/methods
Decision-makers that have vested interest
Researchers that have vested interest
Users of the tools/databases/methods
Data curators
Task Team: Bioinformatics Toolbox Development
The right tools for the job

What’s in it for you:
1. Tool/database/method visibility
2. Integration with other approaches and data curators
3. Assistance in getting these approaches in the hands of decision makers
4. Available through a common web portal
5. Collaborative development of publications
6. Training and outreach opportunities
Task Team: Bioinformatics Toolbox Development
The right tools for the job

What:
1. Develop a bioinformatics toolbox for species extrapolation
2. Focus on coordination with the AOP-KB
3. Develop cross cutting case examples
Task Team: Bioinformatics Toolbox Development
The right tools for the job

What:
1. Develop a bioinformatics toolbox for species extrapolation
   - Identification of published and accessible tools/databases/methods for species extrapolation (focus on bioinformatics approaches)
   - Develop criteria for tool/database/method development for inclusion
   - Draft criteria/guidance for development and application of bioinformatics approaches in regulatory decision-making
   - Understand limitations of the data (e.g., sequence availability, annotation) and working to fill gaps and advance/improve data quality and availability
Task Team: Bioinformatics Toolbox Development
The right tools for the job

What:

1. Develop a bioinformatics toolbox for species extrapolation

2. Focus on coordination with the AOP-KB
   - Coordinate toolbox development, tied into (Handbook Guidance, Gardening, and Internal Review (HGGIR) for domain of applicability)
   - Outline steps for interoperability with the AOP Knowledgebase and selected key 3rd party tools including agreeing common ontologies, funding etc.
   - Advances in data model
   - KB structure
Task Team: Bioinformatics Toolbox Development
The right tools for the job

What:
1. Develop a bioinformatics toolbox for species extrapolation
2. Focus on coordination with the AOP-KB
3. Develop cross cutting case examples
   • Identify published case examples
   • Demonstrate utility of the toolbox for defined challenges in chemical risk assessment
   • Opportunities for define Accelerating the Pace of Chemical Risk Assessment (APCRA) case examples
      • International governmental collaboration
      • Development of new hazard, exposure, and RA methods for chemical evaluation
Task Team: Bioinformatics Toolbox Development
The right tools for the job

**Time Commitment:**
Looking for those that are already working in this area, limited time commitment because it is part of your everyday efforts currently. Interested in active participation.

- Quarterly Team Meetings
- In person meeting centered around an Annual Meeting for a professional Society
- Online communication – everyone has too many meetings, limit unnecessary connections
Task Team: Bioinformatics Toolbox Development

Envisioned Timelines:

**Year 1**

Collect information on available tools resources via survey of ICACSER membership and data synthesis

- Name of tool/DB/method
- Role in development of the tool
- Development status of tool
- Architecture/programming language/host
- Domain of applicability
- What is it intended to do? How does it work?
- Publications describing tool/db/methods
- Case examples developed/published
- Use in decision-making?
- Developed for whom
- Interest in inclusion in bioinformatics toolbox
- What do you consider to be criteria for inclusion of a tool/db/method in the bioinformatics toolbox?
- What professional societies should be engaged in ICACSER?

Face-to-Face meeting at SETAC NA – discuss tools and begin discussions on criteria for inclusion

Continue discussion on criteria/guidelines for inclusion - Engage decision-makers

Identify case examples to demonstrate applications

- Define domain of applicability
- Data rich/Data poor
- Chemical stressors
- Biological pathways
- Develop manuscript
Task Team: Bioinformatics Toolbox Development

**Envisioned Timelines:**
*Year 2*

Define training needs and capabilities

Propose joint short courses, continuing education courses

Lead sessions/present at sessions at professional societies

Draft criteria/guidance document for development and application of bioinformatics approaches in regulatory decision-making

Develop manuscript
Task Team: Bioinformatics Toolbox Development

**Envisioned Timelines:**

*Years 3&4*

- Criteria/Guidance document
- Communication
- Training and outreach continued Workshop(s)
- Publication(s)
- Toxicokinetic considerations
Communicate a Shared Scientific Vision

- Develop and provide training
- Communicate Bioinformatics Pipeline – Using the toolbox
  - Publications,
  - Sessions/meetings/workshops
Teams:

- Define the global regulatory landscape/need
- Develop a bioinformatics toolbox
- Communicate a shared scientific vision

March 2022
Kickoff Webinar

April 2022
Identify members

May-June 2022
Team meetings

November 2022 SETAC Pittsburgh
ICACSER Face to Face

Define approaches
Case Examples
Publications
Presentations
Training
How to join a team?

Volunteer!
If you are a SETAC member
You can use your credentials
You DO NOT need to be a SETAC member
Can create an account to access ICACSER Team information
STEP 1: Please select your member type below.

You can choose between a free guest account or a paid membership account that comes with many benefits. Membership growth in developing economies is an important part of SETAC's mission. If you live in one of the areas that is categorized low- or middle-income by the World Bank (plus a few modifications to benefit even more members), you are eligible for discounted membership rates. Please select the country you reside in below to see if you qualify for a discount.

Please note, if you select a discount even though you do not qualify for it, SETAC will invoice you for the difference.

United States

- Guest
  - Guest - Student
  - Member - High-Income Economies
  - Member - Middle-Income Economies
  - Member - Low-Income Economies
  - Member - Student, High-Income Economies
  - Member - Student, Middle-Income Economies
  - Member - Student, Low-Income Economies

Continue »
STEP 2: Create Your Username

We suggest you use your email address as your username.
All fields are required. Your username must be between 4 and 20 characters and can contain only letters, numbers and the @ sign, with no other special characters or spaces allowed.

Register using your social profile
- Login with Facebook
- Login with LinkedIn

Registration Information
- Username
- First Name
- Last Name

Continue
SETAC and ICACSER

Science Corner webpage
• www.setac.org/scixspecie

Resources and tools

Publications

Webinar Series
Resources for ICACSER

• Join ICACSER by emailing:
  • LaLone.Carlie@epa.gov
  • Geoff.Hodges@unilever.com

• Publication:

• SETAC Websites:
  • https://www.setac.org/general/custom.asp?page=scixspecies

• Professional meeting sessions:
  • May 2022 SETAC EU Computational new approach methods (NAMs) supporting regulatory decision making for chemical safety
  • March 2022 SOT Roundtable Cross Species Extrapolation: opportunities in a 21st century regulatory non-animal testing world
  • November 2021 SETAC NA SciCon4 Bioinformatics to inform cross species extrapolations in regulatory toxicology: What tools are available?
  • May 2021 SETAC EU SciCon2 Cross Species Extrapolation: opportunities in a 21st century regulatory non-animal testing world
Progress and Next Steps

- Create Steering Committee
- Develop initial mission statement and define objectives
- Define relationships with appropriate professional societies
- Publish article describing the Consortium
- Create website for ICACSER
- Introduce topics at SETAC and SOT professional meetings
- Develop invited participant list
- Develop a webinar series to introduce tasks more broadly
  - Self nomination of presenters
- Kickoff teams to work on tasks – June 22, 2022, 9-10:00 AM CDT
  - Invite or Self nomination
  - Develop meeting schedules for Task Teams and ICACSER
Questions?!?!?

Sign up to join a team and/or stay informed:

https://www.setac.org/group/ICACSER