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# Cell and Developmental Biology (CDEV) Subgroup Business Meeting

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SMB 2023

Columbus, OH, USA

July 18, 2023



## **SMB Subgroup on Cell and Developmental Biology**

[smbcelldevbio@gmail.com](mailto:smbcelldevbio@gmail.com)



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# Business meeting agenda

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- CDEV subgroup description + expectations
- Subgroup accounts, leadership, + membership
- Subgroup activities (at + beyond the SMB Annual Meeting)
- Additional time for discussion

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# SMB CDEV description

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The **Subgroup on Cell and Developmental Biology** brings together interdisciplinary scientists with shared and complementary interests in the mathematics of multiscale cellular dynamics. Researchers in this subgroup work on questions related to how cells make decisions in development, how gene regulatory networks influence cell fate, how internal filaments affect cell shape and intracellular dynamics, how cells interact with external signals, and how tissues and patterns form robustly during development, among many other questions. Cell and developmental biology has long proven a fertile ground for mathematical modeling and, with recent experimental advances, it is becoming an increasingly quantitative discipline. We are now able to constrain and quantify mathematical models of cellular dynamics, growing the potential for models to be used in a predictive way. The objective of this subgroup is to accelerate these efforts, encourage the interactions of researchers across disciplines and biological scales, and support the use of mathematical modeling as part of the ‘toolkit’ of cell and developmental biology.

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# SMB subgroup expectations

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- Organize a mini-symposium at the SMB Annual Meeting
- Conduct a business meeting at the SMB Annual Meeting
- Maintain a membership of at least 50 members
- Write an annual report on subgroup activities
- Provide a periodic “state of the field” publication or thematic special issue in the SMB’s flagship journal, the *Bulletin of Mathematical Biology*
- Manage funding of \$1500 per year for subgroup activities

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# How to find us

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- Twitter: @SMBdevBio
- Website: <https://smb-celldevbio.github.io>
- Email: [smbcelldevbio@gmail.com](mailto:smbcelldevbio@gmail.com)
- Google group: [https://groups.google.com/g/smb\\_devbio\\_subgroup](https://groups.google.com/g/smb_devbio_subgroup)

Our Twitter  
account:



Our website:



[smbcelldevbio@gmail.com](mailto:smbcelldevbio@gmail.com)



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# CDEV subgroup officers

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Alexandria  
Volkening  
**Chair**  
(Purdue  
University, USA)



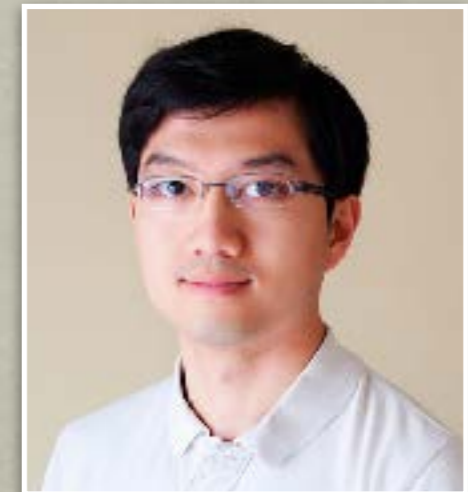
Alessandra  
Bonfanti  
**Secretary**  
(Politecnico di  
Milano, Italy)



Maria Abou Chakra  
**Committee  
member**  
(University of  
Toronto, Canada)



Carina Dunlop  
**Committee  
member**  
(University of  
Surrey, UK)



Tian Hong  
**Committee  
member**  
(University of  
Tennessee, Knoxville,  
USA)

# Current CDEV membership

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- As of summer 2023, we have **158 members**
- Members must select their group membership via their SMB account.
- We maintain an *smb\_devbio\_subgroup* listserv on Google groups, and most subgroup communication happens via this listserv (**306 members**)
- Please let us know if you would like to be on the listserv and are not currently receive our (roughly) monthly newsletter.

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# CDEV activities at the Annual Meeting

- Pre-conference: CDEV presenters invited to share research images, etc. for highlighting their talks, posters, and sessions
- Business meeting
- Subgroup mini-symposium:

## Data-driven, modeling, and topological techniques in cell and developmental biology

Organized by: Alexandria Volkening, Andreas Butterschoen, Veronica Ciocanel

Note: this minisymposium has multiple sessions. The other session is MS04-CDEV-1.

- **Dhananjay Bhaskar** Yale University (Department of Genetics)  
"Analyzing Spatiotemporal Signaling Patterns using Geometric Scattering and Persistent Homology"
- **Kelsha Cook** Clemson University (School of Mathematical and Statistical Sciences)  
"Predictive Modeling of the Cytoskeleton"
- **Calina Copos** Northeastern University (Biology and Mathematics)  
"From microscopy to the distribution of mechanochemical efforts across a pair of cells"
- **Daniel A. Cruz** University of Florida (Department of Medicine)  
"Topological data analysis of pattern formation in stem cell colonies"

## Data-driven, modeling, and topological techniques in cell and developmental biology

Organized by: Alexandria Volkening, Andreas Butterschoen, Veronica Ciocanel

Note: this minisymposium has multiple sessions. The other session is MS03-CDEV-1.

- **Joel Dokmegan** Northwestern University (Molecular Biosciences)  
"Spectral Decomposition of Morphogenesis"
- **John Nardini** The College of New Jersey (Mathematics & Statistics)  
"Statistical and Topological Summaries Aid Disease Detection for Segmented Retinal Vascular Images"
- **Anna Nelson** Duke University (Department of Mathematics)  
"Mathematical modeling of microtubule assembly and polarity in dendrites"
- **Shayne M. Plourde** the Ohio State University (Molecular, Cellular, and Developmental Biology Program)  
"Asymmetric Centrosome Maturation in the Early *C. elegans* Embryo: Insights from Multi-scale Microscopy and Modeling"

- Poster judging of student and postdoc posters
  - Special thanks to those who volunteered to judge posters!
  - Winners will be announced by email following the conference
- Informal social

# CDEV activities at the Annual Meeting

About 60 scientists are presenting in the CDEV track, across minisymposia (6 sessions, several with 2 parts), contributed talks (3 sessions), and posters (10 posters in 2 sessions)

Special thanks to those who organized CDEV-track minisymposia!

**MS05-CDEV-1:**  
**Connecting mathematical models of pattern formation & organization at cell and/or tissue level with experimental results**

**Organized by:** Diana White

**MS03-CDEV-2:**  
**Polarity and patterns meet biophysical and biochemical dynamics**

**Organized by:** Adriana Dawes, S. Seirin-Lee

**MS04-CDEV-2:**  
**Stochastic effects in cell biology across scales**

**Organized by:** James MacLaurin, Victor Matveev

**MS05-CDEV-2:**  
**The role of the microenvironment in controlling cell phenotypic decisions across scales**

**Organized by:** Laura F. Strube, Adam L. MacLean

**MS06-CDEV-2:**  
**Recent Studies on the Biomechanics and Fluid Dynamics of Living Systems: Cellular Biomechanics and Microfluidics**

**Organized by:** Wanda Strychalski, Alexander Hoover

**MS06-CDEV-1:**  
**Computational models for developmental and cell biology: A celebration of the works of Prof. Ching-Shan Chou**

**Organized by:** Wing-Cheong Lo, Weitao Chen, Wenrui Hao, Leili Shahriyari

**MS07-CDEV-1:**  
**Computational models for developmental and cell biology: A celebration of the works of Prof. Ching-Shan Chou**

**Organized by:** Wing-Cheong Lo, Weitao Chen, Wenrui Hao, Leili Shahriyari

**MS07-CDEV-2:**  
**Recent Studies on the Biomechanics and Fluid Dynamics of Living Systems: Cellular Biomechanics and Microfluidics**

**Organized by:** Wanda Strychalski, Alexander Hoover

# CDEV activities

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## Blog posts:

- Approximately once a month, shared through email and Twitter
- Featured researchers for summer 2022–2023:
  - Dr. Robyn Shuttleworth (Altos Labs)
  - Dr. Sasha Sherman (Applied BioMath)
  - Dr. Bernie Daigle (Biology+CS, University of Memphis)
  - Dr. Mindy Liu Perkins (EMBL)
  - Dr. Svetlana Petrenko (Math, University College London)
  - Dr. Yiteng Dang (Max Planck Complex Systems + Cell Bio)
  - Jelle van der Voort (Math, Leiden University)
  - Dr. Roeland Merks (Math, Leiden University)
  - Dr. Jia Gou (Math, University of California, Riverside)
- We encourage interview nominations (including self nominations) of folks at all career stages
- We encourage blog posts by folks on the job market
- See our website:



# CDEV activities

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## Twitter presence:

- Tag *@SMBdevBio* with your conference announcements, new preprints and publications, graduations or new positions, etc. and we'll amplify your announcement.
- Currently 859 followers (up ~16% in the last year)
- See our Twitter account:



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# CDEV activities

- Continuing to support Maria Abou Chakra's biweekly discussion group "Modeling cell development and regeneration"
- Contact Maria to join the listserv and go to our website to sign up for the Slack channel for this!

**SMB Subgroup on Cell and Developmental Biology**[ABOUT](#)[BLOG](#)[INITIATIVES](#)[JOB POSTINGS](#)[CONTACT](#)

## Subgroup Initiatives

### Discussion Group: Modeling Cell Development and Regeneration

Dr. Maria Abou Chakra has been running a discussion group on "Modeling Cell development and Regeneration". The goal of this group is to explore current models in cell development and regeneration, and discuss challenges, emerging questions and solutions relating to this topic. It also aims to build a community of researchers with shared interests. We warmly recommend this group; you can sign up [here](#).



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# Elections: 2024

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- Want to get involved in CDEV? We'll be holding elections for all officer positions next summer.
- Reach out to any current officer if you have questions about what these positions entail or are interested in running.
- If you would like to nominate someone to serve in a CDEV position, please email [smbcelldevbio@gmail.com](mailto:smbcelldevbio@gmail.com).

Special thanks to the 2020–2022 officers who guided CDEV through the pandemic and remain available when we've had questions: Veronica Ciocanel, Ruben Perez-Carrasco, Linus Schumacher, Tracy Stephen, and Renske Vroomans!

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# Suggestions?

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- Tutorials?
- Online mini-workshop?
- CDEV meetups at other conferences?
- Special issues in the *Bulletin of Mathematical Biology*?
- LinkedIn, Mastodon, or Instagram presence?
- Interviews or blog posts?
  - We welcome nominations (including self-nominations) for highlighted researchers!
- Other ways to build community?



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Thank you!

