

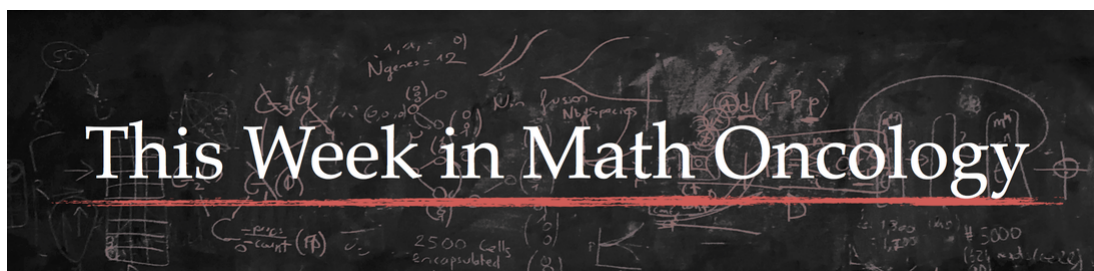


## This week in MathOnco 191

1 message

**This week in Mathematical Oncology** <thisweekmathonco@substack.com>  
To: cristian.axenie@gmail.com <cristian.axenie@gmail.com>

Today, 14:01



# This week in MathOnco 191

Vasculogenesis, spatial distribution models, precision dosing, collateral sensitivity, 2021 in review, and more.

Jeffrey West, Maximilian Strobl, and Sandy Anderson

Jan 6   

"This week in Mathematical Oncology" – Jan. 6, 2022

> [mathematical-oncology.org](https://mathematical-oncology.org)

From the editor:

Happy New Year! The Mathematical Oncology team is expanding. Please welcome **Saskia Haupt** (Heidelberg University), who will be helping us keep the [mathematical-oncology.org](https://mathematical-oncology.org) website up-to-date. Thanks for volunteering Saskia!

**Jeffrey West**

[jeffrey.west@moffitt.org](mailto:jeffrey.west@moffitt.org)

PS, don't miss David Basanta's "**Year in Review**" [blog post](#), providing a summary all the exciting posts from 2021.



In order to better plan out additional website features, we are asking you to complete this [short survey](#) (~5 minutes). The first section (1 page) is about the newsletter, and the second is about the website (1 page).

[MathOnco Survey](#)

We have many exciting plans for 2022, but we want to hear from you. For example - what would you rather us work on next:

- Lab pages featuring MathOnco folks around the world
- Search bar: search MathOnco web page by topic
- Calendar of seminars/abstracts/deadlines/...
- A collection of educational resources (recordings of tutorials, lectures, lecture material, ...)

Please let us know by filling out the survey, found [here](#).

Together, we continue to build up the field of mathematical oncology!



1. [A novel nonlocal partial differential equation model of endothelial progenitor cell cluster formation during the early stages of](#)

## vasculogenesis

Chiara Villa, Alf Gerisch, Mark A. J. Chaplain

### 2. Extinction of Bistable Populations is Affected by the Shape of their Initial Spatial Distribution

Yifei Li, Stuart T. Johnston, Pascal R. Buenzli, Peter van Heijster, Matthew J. Simpson

### 3. Digital Evolution for Ecology Research: A Review

Emily Dolson, Charles Ofria

### 4. A continued learning approach for model-informed precision dosing: updating models in clinical practice

Corinna Maier, Jana de Wiljes, Niklas Hartung, Charlotte Kloft, Wilhelm Huisinga

### 5. A phenotype-structured model to reproduce the avascular growth of a tumor and its interaction with the surrounding environment

Giada Fiandaca, Sara Bernardi, Marco Scianna, Marcello Edoardo Delitala

### 6. Combination of antiangiogenic treatment with chemotherapy as a multi-input optimal control problem

Urszula Ledzewicz, Heinz Schättler

### 7. Dynamic Phenotypic Switching and Group Behavior Help Non-Small Cell Lung Cancer Cells Evade Chemotherapy

Arin Nam, Atish Mohanty, Supriyo Bhattacharya, Sourabh Kotnala, ..., Herbert Levine, Mohit Kumar Jolly, Prakash Kulkarni, Ravi Salgia

### 8. Data-Driven Discovery of Mathematical and Physical Relations in Oncology Data Using Human-Understandable Machine Learning

Daria Kurz, Carlos Salort Sánchez, Cristian Axenie



### 1. Bridging scales in a multiscale pattern-forming system

Laeschkir Würthner, Fridtjof Brauns, Grzegorz Pawlik, Jacob Halatek, Jacob Kerssemakers, Cees Dekker, Erwin Frey

2. Interpreting dN/dS under different selective regimes in cancer evolution  
*Andrés Pérez-Figueroa, David Posada*
3. Dynamic collateral sensitivity profiles highlight challenges and opportunities for optimizing antibiotic sequences  
*Jeff Maltas, Kevin B Wood*
4. Mathematical modelling, selection and hierarchical inference to determine the minimal dose in IFN $\alpha$  therapy against Myeloproliferative Neoplasms  
*Gurvan Hermange, William Vainchenker, Isabelle Plo, Paul-Henry Cournède*

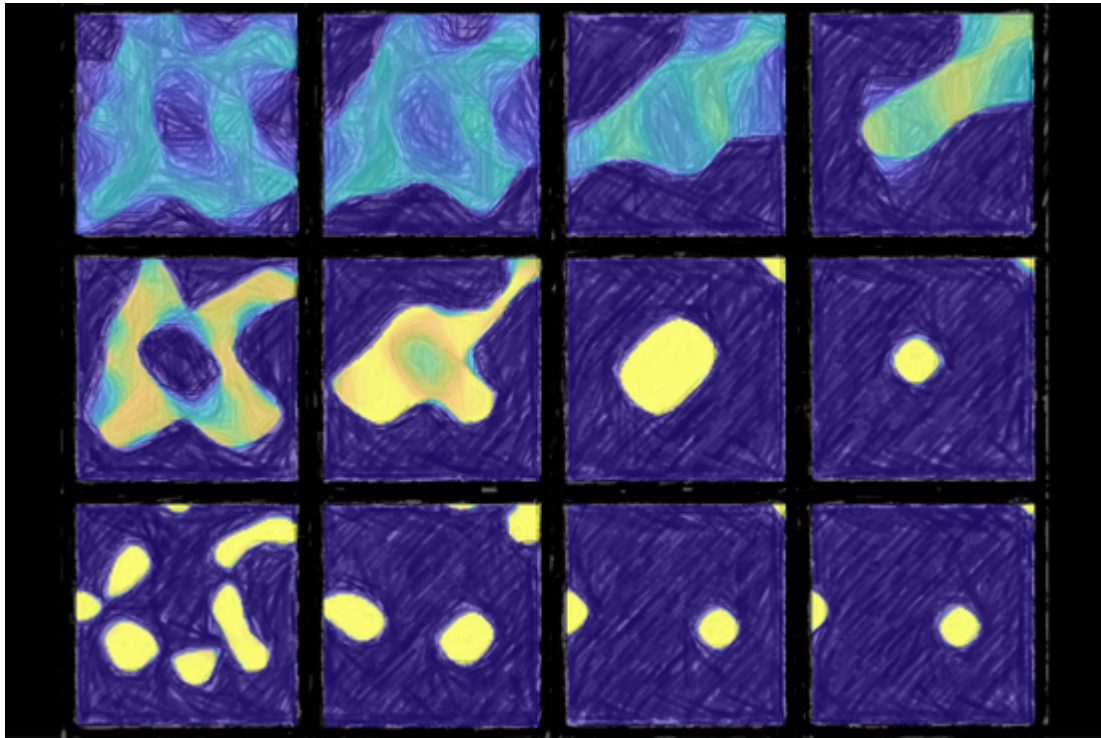


1. Biological Modeling  
**Phillip Compeau:** *A free course in modeling biological systems at multiple scales*



The newsletter now has a dedicated homepage where we post the **cover artwork** for each issue. We encourage submissions that coincide with the release of a recent paper from your group.





**Caption:** We developed a novel nonlocal partial differential equation model of the early stages of cluster-based vasculogenesis in order to disentangle the mechanisms responsible for the formation and size of the endothelial progenitor cell (EPC) clusters characterising this neovascularisation process with big therapeutic potential (e.g. in tumours and ischemia). In this figure we show snapshots of numerical simulations suggesting that increasing matrix degradation (top-to-bottom), likely linked with hypoxia, might speed up cluster formation (EPC density plot, time increasing left-to-right; figures have been digitally enhanced) without affecting cluster size. For more detail, read [here](#).

**Created by:** [Chiara Villa](#)



Visit the mathematical oncology [page](#) to view jobs, meetings, and special issues. We will post new additions here, but the full list can found at [mathematical-oncology.org](http://mathematical-oncology.org).

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