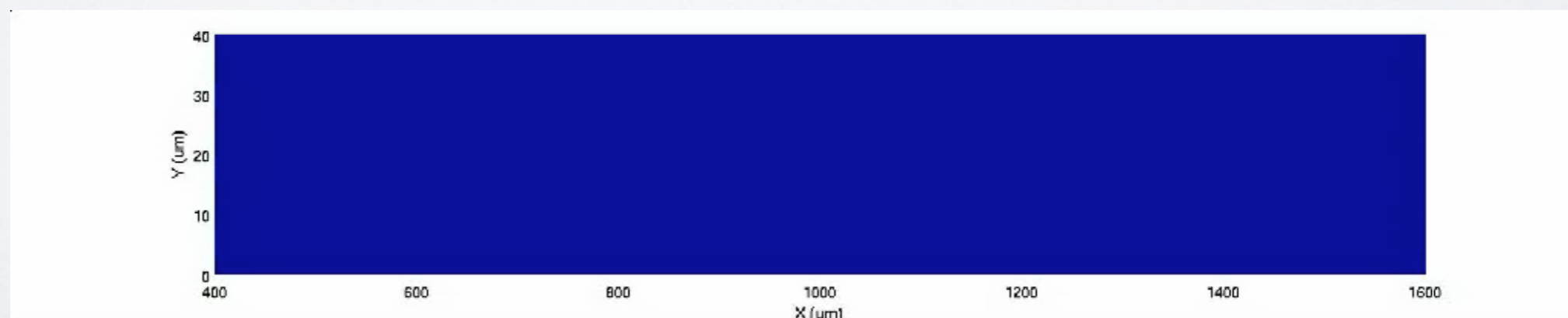
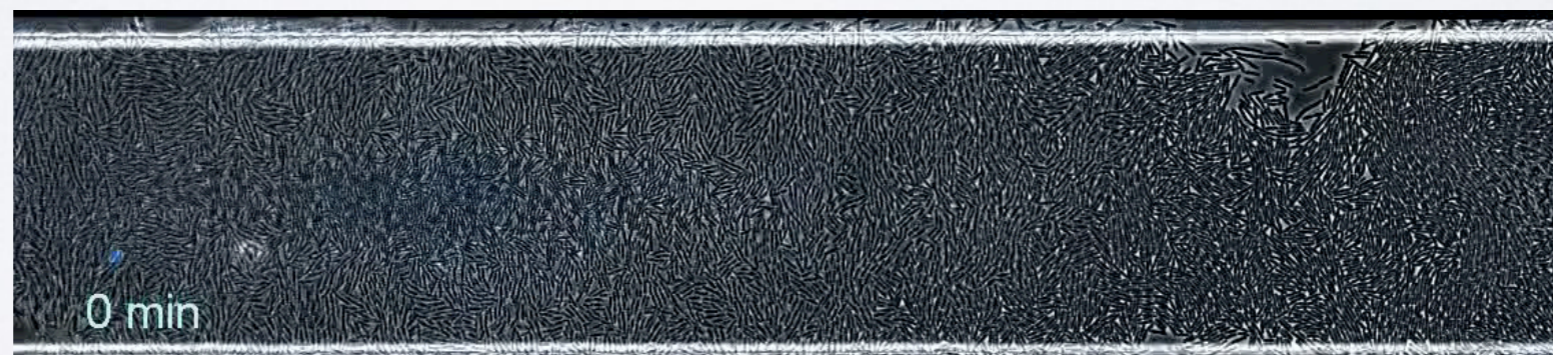
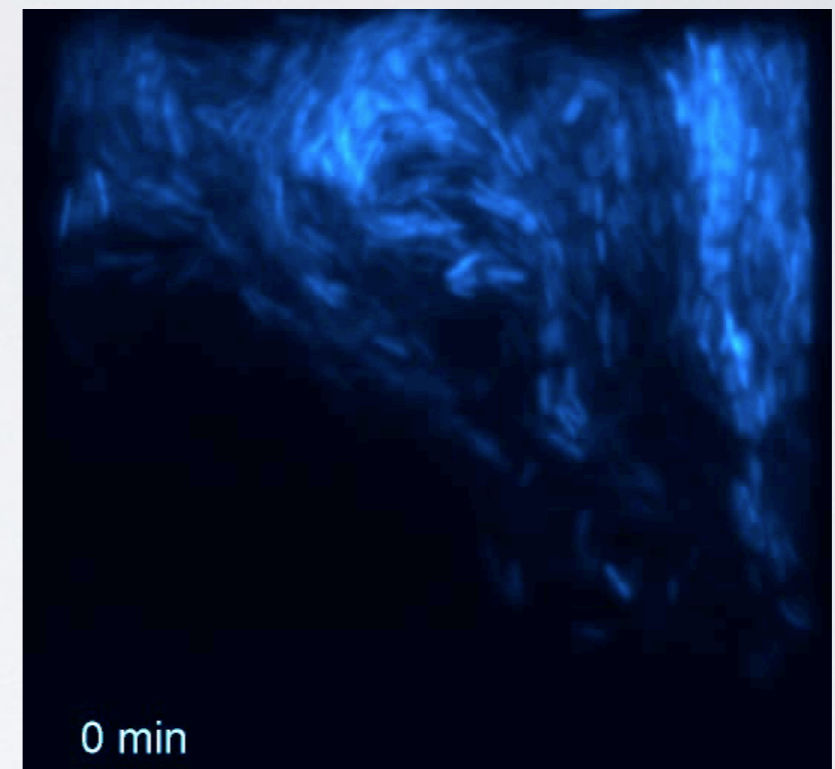


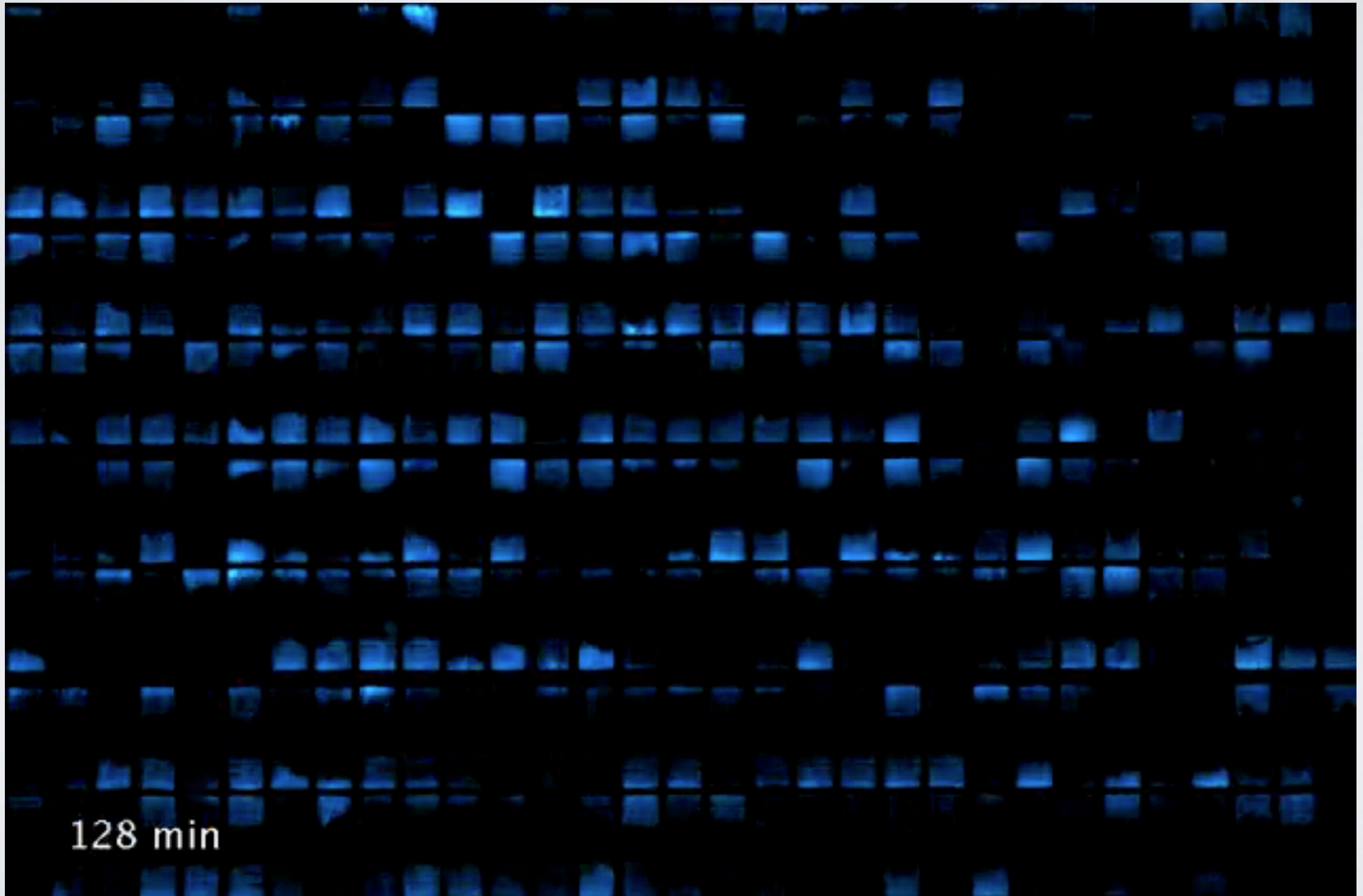
MODELLING IN BIOLOGY

Prof Guy-Bart Stan
Dr Tom Ouldridge

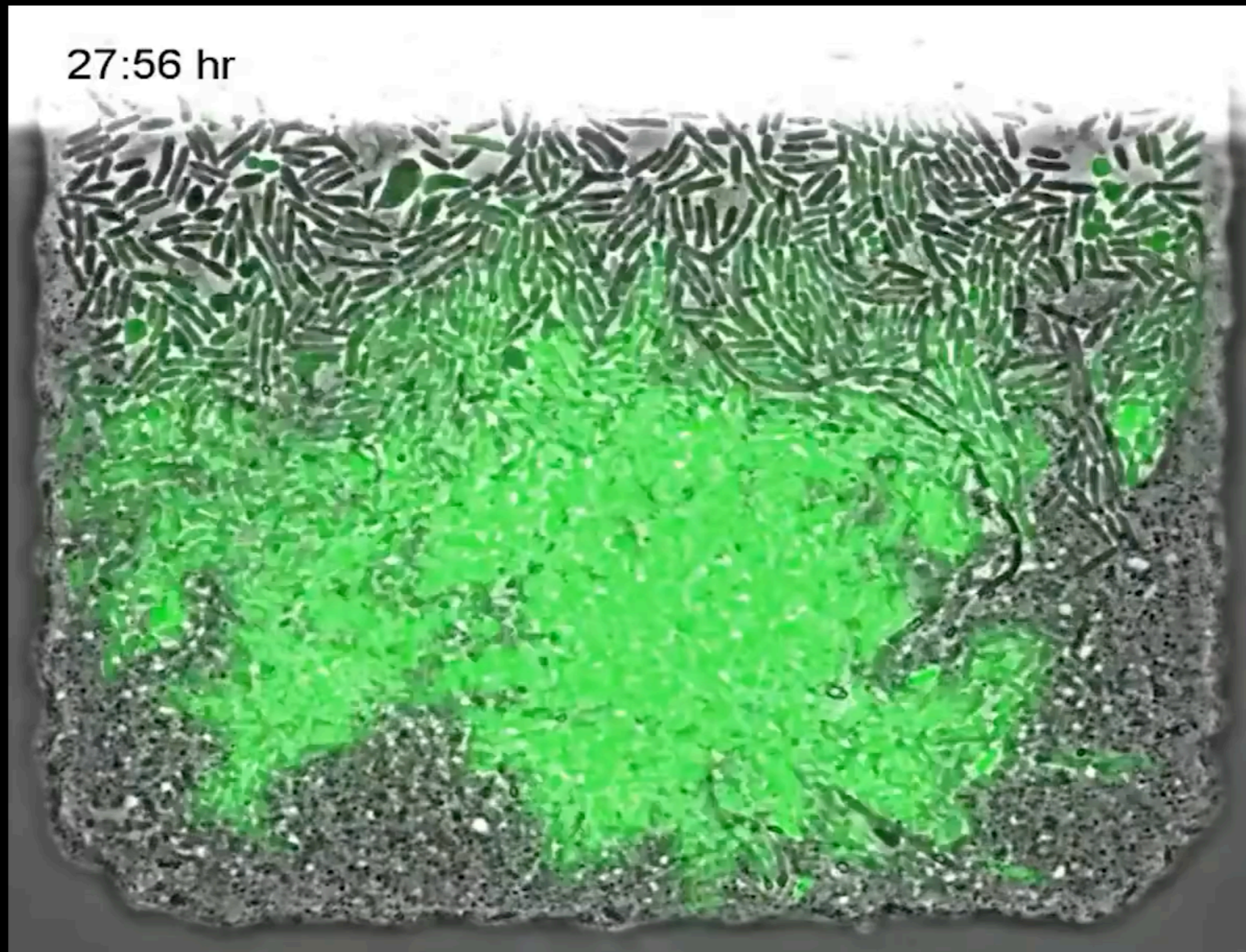
WHY DO WE NEED MODELLING?



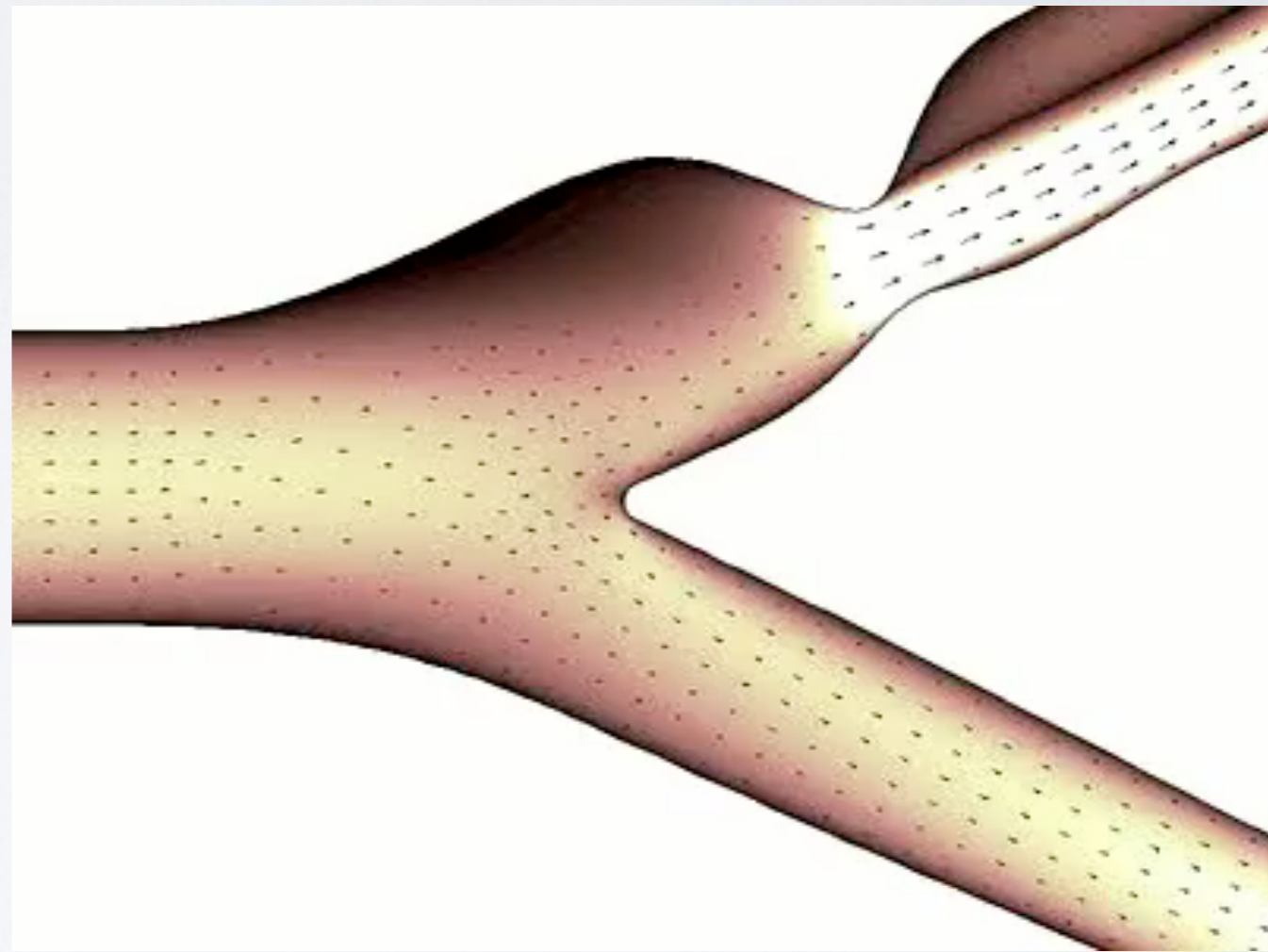
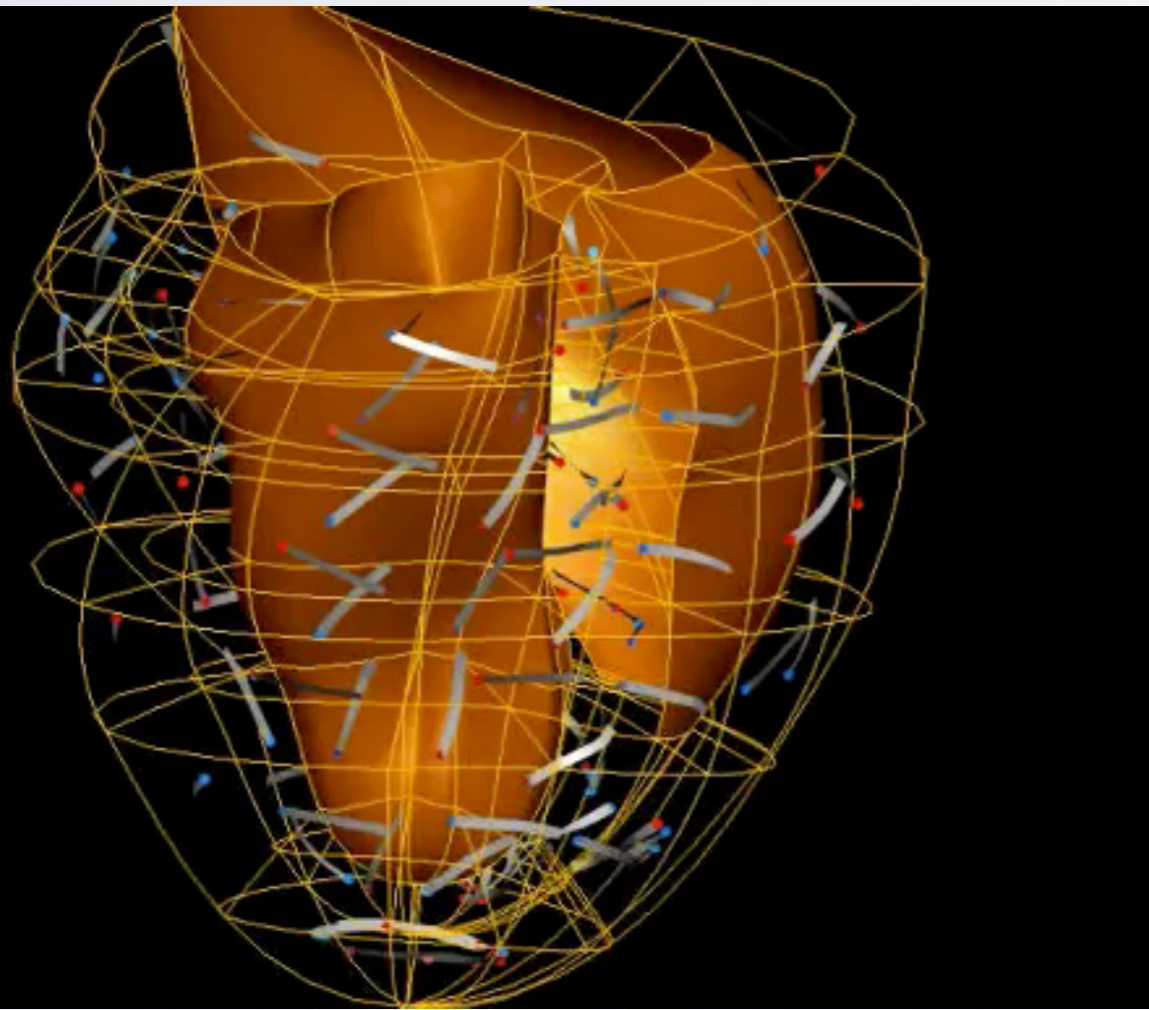
WHY DO WE NEED MODELLING?



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WHY DO WE NEED MODELLING?

- To understand complex systems/phenomena
- To predict outcomes/behaviours under various changes in the system under observation or in its environment
- To propose ways to improve the behaviour of the system through mathematical analysis and simulations

Modelling, analysis and simulation, if they can be done, are often much more time and cost effective than experimenting on a real system or a prototype

MODELLING IN BIOLOGY: OVERVIEW

Deterministic Models
Dynamical Systems
Analysis and Simulations

Lecturer: Guy-Bart Stan

Modelling variability
Stochastic dynamics
Networks and motifs

Lecturer: Tom Ouldridge

SOME OTHER INTERESTING VIDEOS

Links to Steve Strogatz's videos on experimental nonlinear dynamics

- **Lorenz Waterwheel:**

<http://uk.youtube.com/watch?v=7iNCfNBEJHo>

- **Double pendulum:**

<http://uk.youtube.com/watch?v=anwl6OZ1UuQ>

- **Airplane wing vibrations (and instabilities!):**

http://uk.youtube.com/watch?v=_Ys8qGxr--M

- **Chemical oscillations (Belousov-Zhabotinsky):**

<http://uk.youtube.com/watch?v=8R33KWPmqlo>

- **Synchronised chaotic circuits and communications:**

http://uk.youtube.com/watch?v=J-ca_bqWp4I

- **Musical chaos:**

<http://uk.youtube.com/watch?v=dL4VKuKNgXI>

<http://uk.youtube.com/watch?v=Wz3cmIVwl30>

Enjoy!