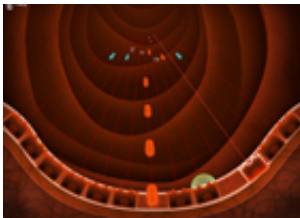


'Gamify your PhD': Gaming and research collide

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An image of 'Dysbiosis', the winning game.

After a two-day games hack in which scientists and games developers came together to create video games from doctoral research, a bacterial shoot-em-up game, 'Dysbiosis', has emerged as the winner of the Wellcome Trust's Gamify Your PhD project.

The game, produced by researcher Margherita Coccia with developers Clockwork Cuckoo and Force of Habit, places the gamer within the [gastrointestinal tract](#), shooting down [harmful bacteria](#) in an addictive immunological battle for digestive health.

Gamify Your PhD put researchers in the role of computer games designers. PhD students in biomedical sciences or [medical humanities](#) were matched with game development teams and given just two days to transform research ideas into playable video games. 'Dysbiosis' will receive further support to be turned into a releasable game.

The six teams for the project were selected from a wide range of applicants, and the subjects developed into games included addiction recovery, malaria, molecular biology, intestinal immunology, [pathogenic bacteria](#) and [reproductive biology](#).

The hack has delivered entertaining and challenging beta games using a variety of different genres to communicate scientific ideas in new and innovative ways, from survival games to puzzles and from shoot-em-ups to 'Guitar Hero'-styled offerings. Find out more about the games and try out some of the beta versions via the links below.

The judging panel was made up of Nate Lanxon (editor, [wired.co.uk](#)), Bennett Foddy (scientist and games designer), Charlie Hasdell (principal designer for SingStar, [Sony Computer Entertainment](#) Europe) and Danny Altmann, (head of the Pathogens, Immunology and [Population Health](#) department at the Wellcome Trust).

Daniel Glaser, head of Special Projects at the Wellcome Trust, who chaired the judging panel, said: "The quality of the games and ideas produced during this short two-day hack is remarkable. And the energy of the teams has been driven by a tangible excitement in the exchange of knowledge. Gamify Your PhD has created an inspiring and innovative collision of popular culture and science, and demonstrated bold new paths for communicating science."

Gamify Your PhD is part of a wider commitment by the Wellcome Trust to using games and gaming culture as a means of engaging people with science. A range of awards schemes is open to developers interested in creating innovative, entertaining and accessible games based on biomedicine and medical history.

The games

Winner

Margherita Coccia with Clockwork Cuckoo and Force of Habit
'[Dysbiosis](#)' (Download and run the game to play, follow link for instructions)

We have evolved different mechanisms in our intestine to keep harmful invading microbes at bay, while fostering our beneficial bacteria. An imbalance in these mechanisms can put us at risk of chronic conditions, such as inflammatory bowel disease, or increase the chance of dangerous infection. In 'Dysbiosis', the player controls a collection of cells that form part of the intestinal wall, shooting harmful oncoming bacteria and allowing through the healthy bacteria. Bonuses allow the player to form a defensive mucus shield, which can be further reinforced through contact with beneficial bacteria. Hits from pathological bacteria can eventually breach the wall, ending the game.

First runner-up

Jane Elizabeth Anne Reid with Opposable Games

'[Monsieur Baguette presents... RNA transcription of Saccharomyces Cerevisiae](#)' (Video link, iOS version pending)

RNA Polymerase II is the key enzyme responsible for the transcription of RNA in yeast cells, in a process that requires phosphorylation of serines and tyrosines in a specific sequence. The team decided to put together a pattern-matching game based around these chemical reactions and add a little humour - resulting in 'Monsieur Baguette presents... RNA transcription of Saccharomyces Cerevisiae'.

Second runner-up

Thomas Forth with Mobile Pie

'[Simalaria](#)' (Click to play in your browser)

Flux-balance analysis of the metabolic reactions in malaria is a powerful tool for predicting the parasite's growth rate in different conditions and in response to different drugs. 'Simalaria' is a resource management puzzle game that accurately reduces a metabolic network with nearly 1000 connections to one with just five important junctions that the user

controls. Can you make the right decisions to create enough offspring and survive at the end of the parasite's 48-hour life cycle? Or will you run out of energy and be overwhelmed by the body's immune system?

Finalists

John J Kendall with Remode

['Campy Command'](#) (Click to play in your browser)

'Campy Command' follows 'Campy' (the pathogenic bacterium *Campylobacter jejuni*) as it travels from its initial host (a chicken), into the aerobic environment (in this case a puddle) and onwards to infect a human host. The game starts out in a rhythm-action style as Campy collects amino acids to convert into energy. The second stage centres on protecting crucial metabolic enzymes from damage by avoiding damaging molecules of O₂ and collecting protective haemerythrin proteins. The third stage focuses on the human immune response to infection as Campy races through the intestinal tract avoiding hydrogen peroxide, antibodies, macrophages and any other threats created by the host to stop it.

Joanne Gordon with Locked Door Puzzle

['Ulysses Contract'](#) (Click to play in your browser)

A survivor game emphasising a 'relational' conception of the will in addiction recovery, 'Ulysses Contract' comprises a complex interplay of internal and external factors following the environment and people in an addict's life. The game has three levels of increasing difficulty, representing natural recovery, treated recovery and the revolving-door phenomenon. In the third level the player has the option of choosing a Ulysses Contract that boosts the will reserve, making it easier for the player to reach the end of the game.

Gemma Sharp with Thought Den

['Lab Hero: Womb for improvement'](#) (Click to play in your browser)

In a rhythm-based parody of ['Guitar Hero'](#), players must guide their

uterus samples through the lab and extract as much high-quality RNA as possible. Each phase of the scientific process is performed by a well-timed key press, and scores are awarded for the number and quality of samples processed. The [game](#) is inspired by the individually mundane actions performed in a lab that collectively amount to the proper rigour of scientific method.

Provided by Wellcome Trust

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