



Rotary Club of Wynberg **WYNPRESS**

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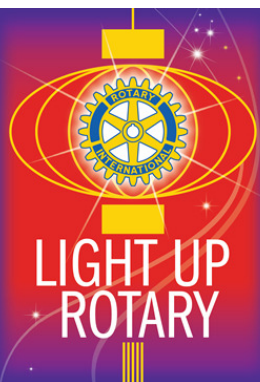
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Rotary in February
World understanding month



EDITORIAL

By Biffy Danckwerts

IT boost for leukaemia research

Posted by IT-Online on Feb 10, 2015

The first comprehensive computer model to simulate the development of blood cells could help in the creation of new treatments for leukaemia and lymphoma, say researchers at the University of Cambridge and Microsoft Research.

The human body produces over 2,5-million new blood cells during every second of our adult lives, but how this process is controlled remains poorly understood. Around 30 000 new patients each year are diagnosed with cancers of the blood each year in the UK alone.

These cancers, which include leukaemia, lymphoma and myeloma, occur when the production of new blood cells gets out of balance, for example if the body produces an overabundance of white blood cells.

Biomedical scientists from the Wellcome Trust-MRC Cambridge Stem Cell Institute and the Cambridge Institute for Medical Research collaborated for the past two years with computational biologists at Microsoft Research and Cambridge University's Department of Biochemistry. This interdisciplinary team of researcher have developed a computer model to help gain a better understanding of the control mechanisms that keep blood production normal.

The details are published today in the journal Nature Biotechnology.

"With this new computer model, we can carry out simulated experiments in seconds that would take many weeks to perform in the laboratory, dramatically speeding up research into blood development and the genetic mutations that cause leukaemia," says Professor Bertie Gottgens (pictured) whose research team is based at the University's Cambridge Institute for Medical Research.

Dr Jasmin Fisher from Microsoft Research and the Department of Biochemistry at the University of Cambridge, says: "This is yet another endorsement of how computer programs empower us to gain better understanding of remarkably complicated processes. What is ground-breaking about the current work is that we show how we can automate the process of building such programs based on raw experimental data. It provides us with a blueprint to develop computer models relevant to other human diseases including common cancers such as breast and colon cancer."

To construct the computer model, PhD student Vicki Moignard from the Stem Cell Institute measured the activity of 48 genes in over 3 900 blood stem cells that give rise to all other types of blood cell: red and white blood cells, and platelets. These genes include TAL1 and RUNX1, both of which are essential for the development of blood stem cells, and hence to human life.

Computational biology PhD student Steven Woodhouse then used the resulting dataset to construct the computer model of blood cell development, using computational approaches originally developed at Microsoft Research for synthesis of computer code. Importantly, subsequent laboratory experiments validated the accuracy of this new computer model.

One way the computer model can be used is to simulate the activity of key genes implicated in blood cancers. For example, around one in five of all children who develop leukaemia have a faulty version of the gene RUNX1, as does a similar proportion of adults with acute myeloid leukaemia, one of the most deadly forms of leukaemia in adults.

The computer model shows how RUNX1 interacts with other genes to control blood cell development: the gene produces a protein also known as Runx1, which in healthy patients activates a particular network of key genes; in patients with leukaemia, an altered form of the protein is thought to suppress this same network.

If the researchers change the “rules” in the network model, they can simulate the formation of abnormal leukaemia cells. By tweaking the leukaemia model until the behaviour of the network reverts back to normal, the researchers believe they can identify promising pathways to target with drugs.

Professor Gottgens adds: “Because the computer simulations are very fast, we can quickly screen through lots of possibilities to pick the most promising ones as pathways for drug development. The cost of developing a new drug is enormous, and much of this cost comes from new candidate drugs failing late in the drug development process. Our model could significantly reduce the risk of failure, with the potential to make drug discovery faster and cheaper.”

The research was supported by the Medical Research Council, the Biotechnology and Biological Sciences Research Council, Leukaemia and Lymphoma Research, the Leukaemia and Lymphoma Society, Microsoft Research and the Wellcome Trust.

Dr Matt Kaiser, Head of Research at UK blood cancer charity Leukaemia & Lymphoma Research, which has funded Professor Gottgens’ team for over a decade, said: “For some leukaemias, the majority of patients still ultimately die from their disease. Even for blood cancers for which the long-term survival chances are fairly good, such as childhood leukaemia, the treatment can be really gruelling. By harnessing the power of cutting-edge computer technology, this research will dramatically speed up the search for more effective and kinder treatments that target these cancers at their roots.”

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Dr Jasmin Fisher, a senior research with Microsoft Research Cambridge, who collaborated on the project, answers questions.

Q: How did you get interested in executable biology?

A: As a biologist, I was always fascinated by the question of how cells make decisions to develop and behave in a certain way. I think about these decision making processes as programs that cells ‘execute’ in order to do the basic functions of life, such as divide, die, migrate, become a muscle cell, a blood cell or, in disease conditions, a cancerous cell, and so on.

If we think about these behaviours as executable cell programs, we can try and trace back the ‘algorithms’ and the ‘computations’ behind these cellular programs, and by doing so we can figure out the actual recipe or set of instructions that a cell needs to follow in order to behave in a particular way. We can also gain insights into what goes wrong in the ‘program’, leading a cell to become cancerous and start dividing in an uncontrolled manner. This vision led me to coin the term Executable Biology more than a decade ago.

Q: Why is applying executable computer algorithms to biological phenomena so significant? What excites you about it?

A: When we apply executable algorithms to model the behaviour of biological systems, we get novel insights into those cellular programs, understanding better how they operate, and we can also learn what goes wrong in a particular program to lead the cells to behave abnormally.

The huge advantage of this executable biology approach is that it also allows us to simulate and analyse these behaviours very quickly – in a matter of seconds

MEETING OF 5 FEBRUARY 2015

Attendance

Present:	18
Apologies:	1
Absent:	5
Make ups:	5
Total attendance:	78 %

Visitors

Welcome to Hugh Maunder who visited us.

Fellowship Announcements

Graham Todd thanked everyone for the lovely flowers and best wishes that were sent to his wife Valda.

Slots

String Smith: A minimum of eight (8) Marshals are needed to assist with the Cape Argus Cycle Tour on Sunday 8 March. A list was sent around for members to indicate their willingness to help with the event. If you did not get a chance to put your name down, please contact String if you can help with this event.

Biffy Danckwerts: Biffy requested those members who are interested in ordering new shirts and sweat-tops to inform her by no later than Monday, after which she will be placing the order with the supplier.

Biffy Danckwerts: The Rotaract Fun Day at Constantia Primary School on the 21 February will need some manpower to help out with the children. It will be from approx. 9:30 to 13:00. Even if you can only do half a shift please let John Vivian know if you are able to give your assistance.

Justin Schonegevel: On Saturday 14 February Library Corners will be delivered and placed at Perivale Primary School for the Grade 1s. Everyone is invited to come along and see and enjoy the handover that will take place from 9 to 10 am.

President's quotes

Instead of the President's quote we had an 'Incoming President's moment.

Stephen Bredenkamp shared with us the following:

1) The poor give more to charity then the rich as percentage of their wealth: +- 3.5% / +- 2.5%

2) According to world statistics our whole club is probably considered rich: to be in the top 10% of the world you need a net R1m (+- USD 100 000).

And so:

"Do not waste your time on Social Questions. What is the matter with the poor is Poverty what is the matter with the rich is Uselessness." — (a very Socialist) George Bernard Shaw

"When I give food to the poor, they call me a saint. When I ask why the poor have no food, they call me a communist." — (Brazilian Bishop in the 1990's) Hélder Câmara

GUEST SPEAKER :

There was no guest speaker this week, due to our business meeting.

GOING FORWARD



Duty Roster

	FEBRUARY			MARCH
	12	19	26	5
Sergeant	Van Eeden	Cleveland	Gavin	Hovstad
Attendance Officer	A O'Driscoll	A O'Driscoll	A O'Driscoll	A O'Driscoll
Wynpress Editorial	Dietrich	Hovstad	Howard	Jackson
Minutes for Wynpress	Smith	Overbosch	Cleveland	Du Plessis
Door Duty	Du Plessis	Gavin	Gowdy	Howard
Grace	Bird	Bredenkamp	Cleveland	Danckwerts
Loyal Toast	Danckwerts	Dietrich	Du Plessis	Gavin
International Toast	Munday	Murphy	A O'Driscoll	K O'Driscoll
Speaker Introduction	N/A	TBA	TBA	N/A
Speaker Thanks	N/A	TBA	TBA	N/A
Find Speakers				Van Wyk, Gowdy, Overbosch, Todd, Murphy, Klotz-Gleave, van Niekerk

Programme

Thu Feb 12	Normal Meeting:- Youth Services Meeting
Sat Feb 14	Books for Perivale Baby College: Training of family supporters
Thu Feb 19	Normal meeting:- Alan Jackson: 'Me Talk'
Sat Feb 21	Rotaract Fun Day (Constantia Primary School)
Feb 22 – Mar 1	Visit by RC Karmøy
Feb 23 - Mar 3	Visit by Oddemarka School
Mon Feb 23	RI #110 birthday
Thu Feb 26	Fellowship meeting with Norwegian guests + Zeekoevlei Sailing Academy
Thu Mar 5	Business meeting
Sun Mar 8	Argus Cycle Tour
Thu Mar 12	Normal meeting : speaker tbc
Weekend 14 th / 15 th Mar	Pearls of the Proms: All hands needed
Sat Mar 14	Baby College – Support needed!
Thu Mar 19	Baby College– Support needed! Rotaract Training Workshop
Thu Mar 28	Normal meeting: speaker tbc
Mar 27 – Mar 29	Interact Camp (hosted by Wynberg Rotaract)
Sat Mar 28	Baby College– Support needed!

See the WRC [calendar](http://wynbergrotary.org.za/calendar/) (http://wynbergrotary.org.za/calendar/) for full details.

Like us on ,  follow us on twitter (@wynbergrotary) and visit the [Rotary Club Wynberg website](http://wynbergrotary.org.za/) to keep up to date

TAILPIECE

“Our greatest glory is not in never falling, but in rising every time we fall”

- Confucius