

Research into human body cell behaviour reveals interesting results

July 23 2015, by Carolyn Monaghan

Researchers from Western Australia, Japan and Germany have collaborated to create the first map of cell-to-cell communication between the hundreds of cell types which make up our bodies.

The work which was published today in *Nature communications* has revealed for the first time that there are literally hundreds of messages passed between any two [cell types](#). Imagine Twitter for cells - hundreds of cell types telling each other what is happening via hundreds of different messages (status updates).

The lead author who conceived the work is UWA Professor Alistair Forrest, Laboratory Head of Systems Biology and Genomics at the Harry Perkins Institute of Medical Research in Perth.

He said rather than traditional biology which focuses on one or two genes at a time, the ethos behind [systems biology](#) is to study all elements (typically genes or proteins) simultaneously to see how they work together in a system (or network).

"Humans have evolved into complex organisms made up of hundreds of specialised cell types," he said.

"Division of labour between specialised cell types allows us to have more complex functions than [single cell organisms](#) like yeast and bacteria. Cell specialization allows us to do things like hear, pump blood and walk.

"To make all of this work the human body has evolved protein messages that are used to communicate between these different cell types to coordinate their activity.

What we have revealed in this new research is that they have many-many ways of talking to each other".

Professor Forrest said the work had important implications for medicine. "The proteins involved are well known to the general public," he said. "Insulin, human growth factor and leptin and their receptors are important in diabetes, height and obesity.

This type of signalling is also very important in our immune response to infectious diseases, and important in cancer, particularly neuroblastoma and lung cancer.

Professor Alistair Forrest recently joined the Harry Perkins Institute of Medical Research to continue his important work in Systems Biology and Genomics with a renewed focus on cancer.

Investigating what happens to this cell-cell information superhighway in [cancer cells](#) and how they interact with the immune system and blood vessels is a key future direction of the lab. It will provide answers to questions about how cancer cells avoid the immune system and recruit a blood supply and has the potential to identify new therapeutic targets.

More information: "A draft network of ligand–receptor-mediated multicellular signalling in human." *Nature Communications* 6, Article number: 7866 [DOI: 10.1038/ncomms8866](https://doi.org/10.1038/ncomms8866)

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