



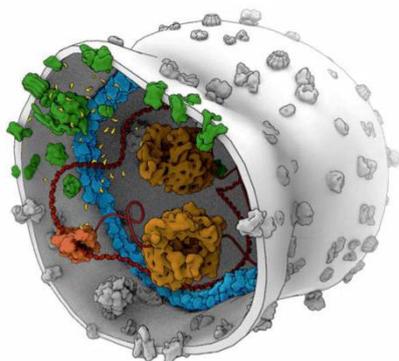
Academy Symposium: Towards Creating a Minimal Cell

Academy Lecture by Jack Szostak: The Origins of Cellular

Date: 24 June 2015, 4.30 p.m. – 6.30 p.m.

Venue: KNAW, The Trippenhuis, Kloveniersburgwal 29, 1011 JV Amsterdam ([route description](#))

Can we build a minimal form of life? Would it be possible to construct a synthetic cell from basic molecular components, a man-made object – say a vesicle filled with biomolecules – that can sustain itself by consuming energy and that can reproduce into similar offspring. The assembly of a cell from basic molecular components is emerging as a new and exceptionally exciting frontier in science and engineering. Over the past decades, many of the molecules that make up cells have been identified and studied. Yet, despite increased chemical and physical understanding of these biomolecules and their mutual interactions, it remains elusive how they together form a cell that can autonomously grow and replicate. Fuelled by recent advances in our ability to purify, assemble, and study basic functional units, it is now time to combine biomolecular building blocks into a functioning synthetic cell.



Artist impression of a possible synthetic cell

Engineering a living cell from basic components is one of the most challenging goals within the life sciences today. Assembly of a synthetic cell will profoundly deepen and propel our fundamental insights into the workings of a living cell. If accomplished, it likely will be ranked as a monumental achievement in science. But the challenge is immense since such an enterprise comprises many aspects such as the ability to sustain a synthetic cell with a stable metabolism that processes nutrients and supports all cellular activities, maintenance of an information-processing system that can replicate a genome and translate its information into proteins and other building blocks, as well as engineering a minimal machinery to provide growth and division of a synthetic cell into offspring. Yet, ideas to address these questions with minimal approaches are now emerging.

This symposium will feature an Academy Lecture entitled ‘The Origins of Cellular Life’ by Nobel Laureate Jack Szostak, professor of Molecular Biology at Harvard University. For more than two decades, Prof. Szostak has been conducting pioneering research on the origin of life on Earth, in vitro evolution of RNA, and the construction of artificial cellular life in the laboratory. His lecture will be preceded by three short lectures by leading Dutch scientists, all three KNAW members, who carry out research towards synthetic cells.



Programme

- 4.00 p.m. – 4.30 p.m. Coffee and registration
- 4.30 p.m. – 4.35 p.m. Opening
- 4.35 p.m. – 4.55 p.m. Cees Dekker, Professor of Molecular Biophysics, Delft University of Technology, Dept. Nanosciences - *Towards division of synthetic cells*
- 4.55 p.m. – 5.15 p.m. Bert Poolman, Professor of Biochemistry, University of Groningen, Dept. Biochemistry - *Towards a metabolism for synthetic cells*
- 5.15 p.m. – 5.35 p.m. Wilhelm Huck, Professor of Organic Chemistry, Radboud University Nijmegen, Institute for Molecules and Materials - *Towards an information carrier in synthetic cells*
- 5.35 p.m. – 5.45 p.m. Introduction Jack Szostak by Cees Dekker
- 5.45 p.m. – 6.30 p.m. Academy Lecture by Jack Szostak, Professor of Molecular Biology, Harvard University: *The Origins of Cellular Life*
- 6.30 p.m. – 7.30 p.m. Drinks