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Lynn Margulis: 1938-2011

November 23, 2011, 10:16 am

By [Michael Ruse](#)



The American biologist Lynn Margulis has died. She had a stroke last week and never recovered. Born in 1938, she was still active as a professor at the University of Massachusetts, Amherst – her home was literally next door to another famous female Amherst inhabitant, poet Emily Dickinson. I am in a state of shock. I visited Lynn last December and hung around her lab for a couple of days. Someone more vibrant and alive it would have been hard to imagine. Being only two years younger than Lynn, I am going into the Thanksgiving Holiday with all sorts of thoughts about Grim Reapers and asking not for whom the bell tolls.

Lynn Margulis – or Lynn Sagan as she was back then, her first husband was the astronomer and science popularizer Carl Sagan – is justly celebrated for her determined claim that the eukaryotic cell (the more complex cell with a nucleus and other parts, organelles) is not something that evolved on its own. It is rather the result of a simpler (prokaryotic) cell incorporating other such cells, which latter (rather than being absorbed) continued their existence within the whole, developing their own contributory functions. In particular, she showed that the mitochondria (the power units of the eukaryotic cell) and the chloroplasts (the organelles in the cells of plants that perform photosynthesis) had their origins as free-standing prokaryotes.

Although others had floated similar ideas earlier in the century, basically the position was thought untenable to the point of being ridiculous. Lynn persisted, getting some 15 rejections before her seminal paper was finally accepted in 1967. Some 15 years later the definitive proof of her position was established, when molecular techniques were sufficiently developed to show that the DNA of the organelles is virtually the same as the DNA of free-standing prokaryotes. For this achievement she was honored by being elected to the National Academy of Sciences.

For someone like me, a historian and philosopher of biology, Lynn was much more interesting than simply as a person who had made a major contribution to science. For me, the interest lay in the fact that Lynn was ever controversial. Most recently, she had been bringing scorn on herself for her championing a theory about the evolution of butterflies, one that claims that the juvenile caterpillars and the adult butterflies evolved separately and then came together as a kind of hybrid. Because she was a member of the National Academy, she was able to place in the *Proceedings* a paper by a proponent of this view. This led one biologist to say that the paper was more appropriate for the *National Enquirer* than the National Academy. It is enough to say that members of the Academy are no longer allowed to place papers in the *Proceedings* without independent review.


My particular interest in Lynn Margulis's work lies in the fact that, along with British chemist James Lovelock, she was one of the original champions of the so-called Gaia hypothesis, the claim that the Earth is in some sense a living organism. To say that this hypothesis was controversial was akin to saying that Napoleon had a bit of a thing about the Russians. What makes the topic so fascinating is that although the scientific community dumped all over the idea – Richard Dawkins (in his *The Extended Phenotype* as always makes good reading on the subject – the general public loved it. Even to this day there are Gaia societies, Gaia spas, Gaia herbal remedies, Gaia networking groups, and much more.

I am writing a book on the topic so that is why I visited with Lynn and her group. I had known her a little before and this was a great opportunity to get to know her better. I came away with my head buzzing from the non-stop talk and flow of ideas. So now I write not to judge Lynn's work. Whatever one says about the rest, all agree that she deserves the fullest admiration for her thinking on the origins of the eukaryotic cell. I write to mourn the passing of one I was proud to call a friend and of one who showed such determination and spirit in pushing ideas she thought right, no matter what the world about her said to the contrary. She could be irritating and frustrating. She could be wrong far more than she could be right. She was a wonderful and generous person.

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**R.O.P. Lopez** 1 day ago


She sounds like an inspiring visionary and I hope she finds a more peaceful world on the other side. Thanks for this touching obituary.

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**laundryroomdisaster** 1 day ago


this is a very nice tribute

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**Charles Kelly** 20 hours ago

I have been a big fan for years. R.I.P.

[Like](#) [Reply](#)

**raymond_j_ritchie** 9 hours ago

It is very sad to hear of her passing. As one who has mucked around with algae, chloroplasts and cyanobacteria and photosynthetic bacteria most of my life I know she made a major contribution to modern biology. The eukaryotic cell and its evolution makes no sense without her endosymbiotic theory. I am also impressed by the quality of the education in modern biology I got at Sydney University. As a first year (1973) I heard of Margulis & Peter Mitchell and so I got essentially the modern version of how a eukaryotic cell is organised and how it works. It was only a few years after she first published her ideas. I have met people younger than me who never heard of either as undergraduates and were taught a 19th century view of cell biology and did not find out what chloroplasts and mitochondria really were until years later. Many great people get a lousy obituary - this is a good one.

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Thomas W 3 hours ago

Very nicely done. I've been impressed with Ms. Margulis's work. Haven't agreed with all of it, but half of scientific progress is "outside the box" ideas.

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