

Lead: phone going off. Freezer calling. Brief power outage to -80 – contains 450 million year old proteins.

Nut graf – runs a lab filled with extinct proteins that span the geologic eras 300 million to 600 million. List achievements. Taken evolution and fused it with molecular biology and advanced biophysics. Latest paper. Comment on how he leads this field.

But this is Thornton's second career – in his first he was an activist for Greenpeace, Wrote a book on it.

Leaves a legacy on his work today. Floor of his lab free of PVC. Casts a critical eye on science – says he realises that everyone in science has an agenda. Also not been shy about facing the implications of his work for intelligent design. Quote.

OR this

Bench in the lab. 300 million year old protein. Bench on a floor with no PVC.

OR

Simulation of ancestral protein.

Break

[[mention intensity here, or even in intro]] Potted history – not a conventional scientific history. played bass in school, English major in Yale, didn't complete. Wanted to find the real world – found it in activism for Greenpeace. Years canvassing – taught him to sell his message in 5 seconds.

Became involved in campaigns – became the 'science guy'. One high – organisation outside White house on incinerators – all but one were stopped.

Eventually wanted to build his own portfolio of work. Had become interested in science through Gpeace work [chk]. After the small matter of finishing his Yale course, ended up on grad program at Columbia. Wrote in his entrance essay – wanted

to explore evol of complexity on molecular level – and focus on steroid hormone receptors. [quote on why chose that cos of past interests]

PhD – started down that path. But also started writing a book; lab during the day and writing and looking after a newborn at night, living in Park Slope before it became trendy. Rob Desalle quote. Probably the only baby being fed out of BPA free bottles before it became PC

Book came out – used to attention. By then already on a fellowship at Columbia and fulfilling his entrance essay. Breakthrough paper – Science 2003. Showed ancient past of steroid receptors – implications for wider actions of endocrine disruptors. Pulls the book off the shelf.....[transition on War and Peace ref?] – then cut to him pulling book of the shelf today...

By this point moved to Oregon, starting his own lab

[insert scene here on this lab meeting? Or just skip it] Lives a green lifestyle but then so does everyone here, where the bike lanes are as wide as the roads. Did search for ages to find flooring. Built a house without PVC. Quote on how doesn't like holier than thou attitude - uncomfortable with it.

Mention his intensity here? Is, but also a sense of humour.

What followed - series three papers that explored the evolution of the steroid receptor in detail.

Paper 1: challenge of how complex system evolved – quote Darwin. Showed that 600 million year old protein sensitive to steroid hormone long before hormone even existed. First run in with ID. Sure ' been there, enjoyed that'.

Second – crystal structure of that receptor. [molecular exploitation] Third, showing the evolutionary path to it was irreversible. Evolutionary ratchet.

break

Cut to 2012. Evolution of a molecular machine. Bit more run in with ID. Doesn't engage with them. Did once with Behe on Zimmer's blog.

Now working on story that connects two halves of his life. Paper showing that estrogen receptor 800 M yr ago only sensitive to estrogen and became progressively more restrictive – explains exquisite sensitivity of the receptor to endocrine disruptors today, introduced in last 100 years.

Also turning attention to DNA binding domain of the protein. Any feeling that he may move on from Oregon... small town??

Does he feel he abandoned environmental movement? No.

Cut to freezer? Or message from freezer on his iPhone. Concluding thoughts. Working with ancient proteins is pretty goddam cool.