External Perspective on ToxCast

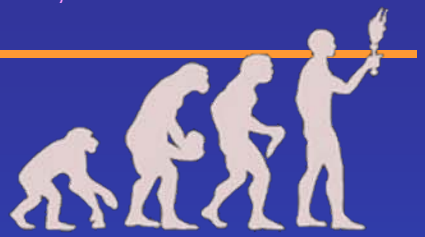
•ToxCast is a new technology, a whole new approach.

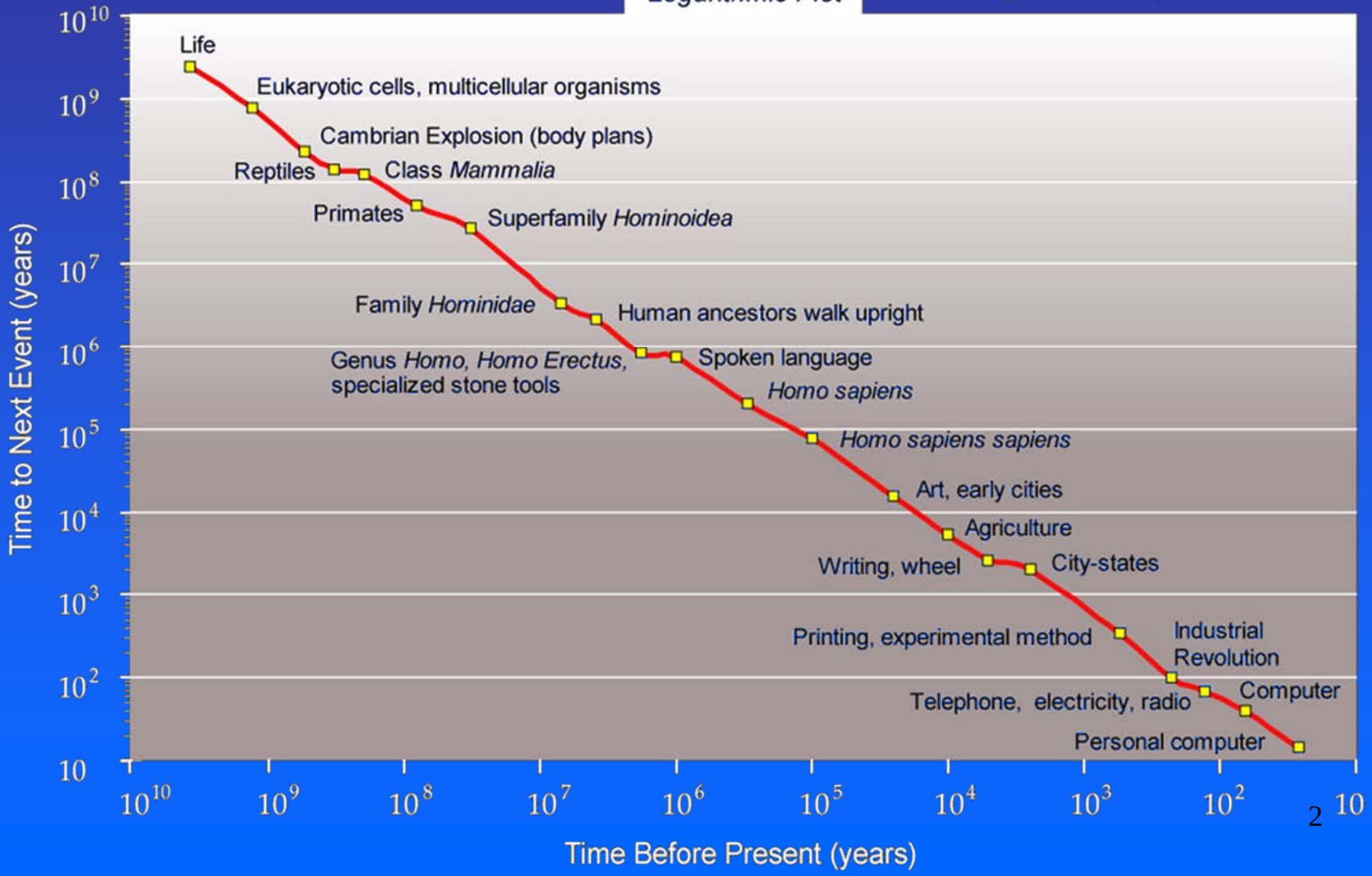
• Ray Kurzweil has noted that the rate of technologic change appears linear to most humans, but this is a mistake. The rate of change is really logarithmic.

•Importantly, this is independent of what key events you choose to measure.

"The Singularity Is Near", Kurzweil, 2005

Countdown to Singularity

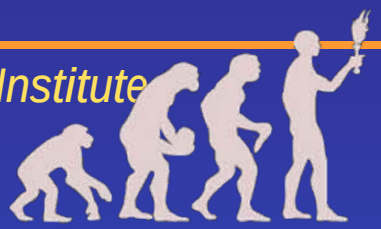


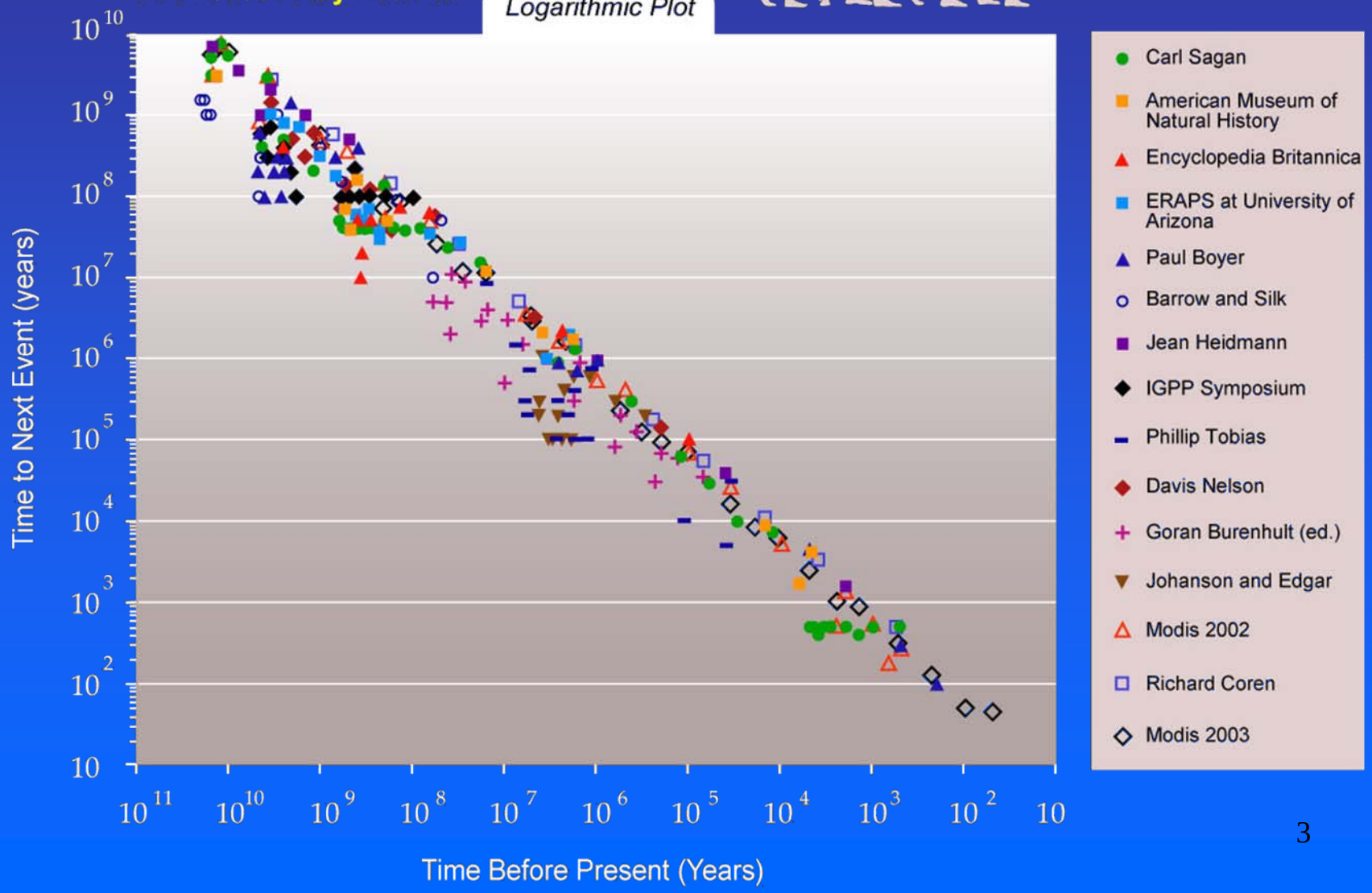


HESI

ILSI Health and Environmental Sciences Institute

Paradigm Shifts for 15 Lists of Key Events





External Perspective on ToxCast, con't…

If we recognize that change happens faster than we are generally prepared for, that has implications for how we should think about it and also for our actions.

Specifically, those people who accept this (now obvious) truth tend to embrace change more quickly, and are thus better prepared to deal with it and to take advantage of the opportunities it offers. They position themselves *in front* of the curve, because they know the curve is coming and can better anticipate where the curve is going to be.

Those who think in linear time will always be behind the curve, always reacting instead of catalyzing.

External Perspective on ToxCast, con't…

Given the speed of technologic change and the pressures on current models of safety testing, something like ToxCast was pre-ordained to happen.

Baby ToxCasts (**i.e., attempts at predicting toxic responses after *in* vitro exposures**) are being developed, on much smaller scales, at companies and in academic departments worldwide right now.

But the scope and public venue of ToxCast is unique. It is transformational, and *hugely* important.

Indeed, the major lesson of the last 5 years in genomics is that "Scale Matters". The more comprehensive our learning set, the better the resulting predictive model.

So given all that… What can HESI do to contribute?

External Perspective on ToxCast, con't…

HESI's role: **Help ToxCast build the best and most comprehensive learning set**.

ToxCast needs lots and lots of compounds of known *in vivo* activity in humans.

HESI is best positioned to help ToxCast find them, being squarely at the intersection of academia, government, and industry.

How? HESI and its Board have the best perspective on that, but I might offer:

1. **Use high-level managerial contacts to get corporate and academic buy-in to contribute compounds and associated data. US, Japan, Europe**.
2. Use a committee structure for the detailed collection and formating of those data.
3. This could take up where the Nonclin/Clin Safety Correlations Tech. Comm. left off.

Probably a 2 yr effort.

The results would be: the database, and any publications (SCI classics *in ovo*).

External Perspective on ToxCast, con't…

The benefits?

1. It keeps HESI in the forefront of efforts to evolve safety testing.
2. It *materially* helps in the global push towards more information-dense and animal-free safety assays.
3. It helps leap-frog us to a more sustainable business future.
4. It's democratizing in the sense that everyone will have the opportunity to benefit from it (large companies as well as those with many fewer resources). The impact will be equally huge at both ends of that spectrum.
5. It puts HESI in the position of midwifing an *entire discipline* which is more sustainable and less burdensome, hopefully just as predictive, and empowering to large corporations as well as individual academic investigators. This is nothing short of historic.