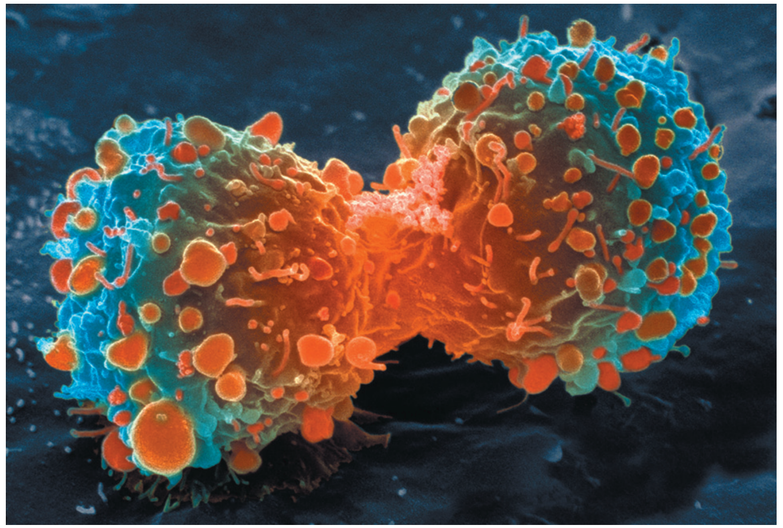
COMMENT



S. GSCHMEISSNER/SPL

Many landmark findings in preclinical oncology research are not reproducible, in part because of inadequate cell lines and animal models.

Raise standards for preclinical cancer research

C. Glenn Begley and **Lee M. Ellis** propose how methods, publications and incentives must change if patients are to benefit.

Efforts over the past decade to characterize the genetic alterations in human cancers have led to a better understanding of molecular drivers of this complex set of diseases. Although we in the cancer field hoped that this would lead to more effective drugs, historically, our ability to translate cancer research to clinical success has been remarkably low[1]. Sadly, clinical trials in oncology have the highest failure rate compared with other therapeutic areas. Given the high unmet need in oncology, it is understandable that barriers to clinical development may be lower than for other disease areas, and a larger number of drugs with suboptimal preclinical validation will enter oncology trials. However, this low success rate is not sustainable or acceptable, and investigators must reassess their approach to translating discovery research into greater clinical success and impact.

Many factors are responsible for the high failure rate, notwithstanding the inherently difficult nature of this disease. Certainly, the limitations of preclinical tools such as inadequate cancer-cell-line and mouse models[2] make it difficult for even ▶

If a job is worth doing, it's worth doing twice

Researchers and funding agency need to put a premium on ensuring that results are reproducible argues **Jonathan F. Russel**

The case for open computer programs

Must try harder

Too many sloppy mistakes are creeping into scientific papers at the data — and at themselves.

Six red flags for suspect work

C. Glenn Begley explains how to recognize the precilinical papers in which the data won't stand up.

Error prone

Biologists must realize the pitfalls of massive amount of data

Know when your numbers are significant

- Nekrutenko & Taylor, Nature Genetics (2012)
- Alsheikh-Ali et al. PLoS ONE (2011)
- Begley & Ellis Nature (2012)