What went wrong in the Duke analysis?

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issue)

There was a lack of transparency

no models available. } can be reproduced.
no computer code }

What went wrong? transparency

The data and code weren’t reproducible

What went wrong? transparency

There was a lack of cooperation

I reluctant to exchange the info.

What happened

Box: How events unfolded

From the article:
Cancer trial errors revealed

2006 Anil Potti, a cancer geneticist at Duke University in Durham, North Carolina, and others file patent applications on the idea of using gene-expression data to predict sensitivity to cancer drugs. Potti is first author on a paper in *Nature Medicine*[1].

2007 Potti is last author on a paper in the *Journal of Clinical Oncology* (*JCO*)[2]. Duke begins three clinical trials to test Potti's predictors in patients with breast or lung cancer.

SEPTEMBER 2009 Keith Baggerly and Kevin Coombes, statisticians at the University of Texas M. D. Anderson Cancer Centre in Houston, publish a paper in *Annals of Applied Statistics*[3] stating that they could not replicate Potti's claims. Duke suspends the trials and asks a review panel to investigate.

NOVEMBER 2009 Potti places data underlying the *JCO* paper online. Baggerly writes to Sally Kornbluth, Duke vice-dean for research, and Michael Cuffe, Duke vice-president for medical affairs, to point out differences from raw data.

DECEMBER 2009 An unredacted copy of the report by Duke's review panel, later obtained by *Nature*, shows that the panel replicated Potti's claims using his data, but were unaware that those data contained discrepancies.

JANUARY 2010 Duke restarts clinical trials.

JULY 2010 *The Cancer Letter* reveals that Potti made false claims about his CV. Trials are suspended and an investigation begins. Harold Varmus, director of the National Cancer Institute in Bethesda, Maryland, asks the Institute of Medicine to review Duke's trials.

NOVEMBER 2010 *JCO* paper is retracted. Duke closes the trials permanently. Potti resigns.

DECEMBER 2010 Institute of Medicine study begins, but will now focus more generally on criteria for genomics predictor.

JANUARY 2011 *Nature Medicine* paper is retracted.

There was a lack of expertise

What went wrong? expertise

lack of expertise in data.
poor stat background.

They used silly prediction rules

What went wrong? expertise

They had study design problems

confounder factors — batches in diff days.

What went wrong? expertise

Their predictions weren't locked down

Changes on the day the test was run.
Change the outcomes in each day ran.

At the end of the day the Potti analysis was fully reproducible

The problem is that the analysis was wrong — due to lack of stat.

OPINION

Opinion: Reproducible research can still be wrong: Adopting a prevention approach

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computational tools such as knitr, iPython notebook, LONI, and Galaxy (8) have simplified the process of distributing reproducible data analyses.