Antibodies make analyses make answers

“If we want accurate answers, we must ensure that our tools work accordingly.”

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DNA makes RNA makes protein. This didactic simplicity revolutionized our perception of biology and is still with us, underlying our understanding of pathophysiology and disease. The latter molecule, protein, is often referred to as the biochemical ‘phenotype’, which entails that proteins are the workhorses of cells.

In medicine, proteins are also markers of disease. Measurement of proteins is often based on antibody recognition of the target protein in, for instance, blood or tissue samples from patients. A hallmark of any analysis is thus the used antibody. In this regard, we read your topical commentary on antibodies, which has gotten elusive with commercial companies providing antibodies with little or no validation [1]. On the other side, our knowledge of proteins as antibody targets has become much more differentiated than mere cDNA deduction of genes.

It seems paradoxical that we need to revisit good laboratory practice on antibody use in an era of systematic quality control. Even peptide hormones known for more than a century are, however, still being measured wrongly with dire consequences for patient diagnostics [2–4]. We, therefore, urge for

stronger actions by the following approaches: antibodies in research should come with the same rules that apply for antibodies for diagnostics. Bad science also affects patients with no intellectual argument for less stringent rules in research; journals should always require validation for used antibodies, where in particular specificity testing is often missed; the trend for complex publications challenges the quality control of each used method. We suggest that researchers consult with the expertise of a given protein and get advice on their accurate measurement. After all, antibodies make analyses make answers. If we want accurate answers, we must ensure that our tools work accordingly.

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References

- 1 Baker M. Reproducibility crisis: blame it on the antibodies. *Nature* 521, 274–276 (2015).
- 2 Rehfeld JF, Gingras MH, Bardram L, Hilsted L, Goetze JP, Poitras P. The Zollinger–Ellison syndrome and mismeasurement of gastrin. *Gastroenterology* 140, 1444–1453 (2011).
- 3 Rehfeld JF, Bardram L, Hilsted L, Poitras P, Goetze JP. Pitfalls in diagnostic gastrin measurements. *Clin. Chem.* 58, 831–836 (2012).
- 4 Rehfeld JF, Hansen JS, Sonne DP, Goetze JP. Biomarkers and immunoassay kits: a matter of growing concern. *Biomark. Med.* 9, 623–624 (2015).