

Diagnostic antibodies – evolution of medical diagnostics

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Be it influenza, cancer, or COVID-19, a key element in the treatment of every disease is diagnostics. Simple at times and other times complex – diagnostic procedures can require basic setups or even highly sophisticated laboratories. Nevertheless, many of today's diagnostic techniques require [custom recombinant antibodies](#).

Never before in the history of medicine has there been a greater variety of diagnostic possibilities. The fact that these developments have mostly occurred in the past two centuries illustrates how eventful the evolution of medical diagnostics really is. Below, some of the most groundbreaking developments will be highlighted in order to understand the complexity of diagnostic tools today. Finally, current developments in the field of medical diagnostics will be illustrated, with a special emphasis on diagnostic testing and the role of antibodies.

Diagnostic methods throughout history

Several achievements in the history of medicine were based on then-novel methods of identifying the nature of disease from which a patient was suffering – usually recognized by characteristic symptoms. This is also related to a different understanding of the human body and its mechanism, which is why concepts like “Humorism” – an understanding of the human body using blood, yellow bile, black bile, and phlegm – were popular from antiquity and throughout the late Middle Ages.[1]

Innovations that had significant impact on diagnostics were the microscope (16th/17th century) and the mercury thermometer (1714), even though interpretation of data made available from these technologies was still being developed. For instance, Karl August Wunderlich – a German physician – wrongly believed that different diseases had particular fever patterns. Additional innovations marking key diagnostic milestones on the road towards today's modern tools are the stethoscope and the X-ray.[1]



Diagnostic methods in the course of time, along with four approaches in today's diagnostics.

In the field of immunology, a continuously widening body of knowledge concerning antibodies and serology have helped to identify various infectious diseases, including Syphilis, Typhoid, and Tuberculosis. Yet another milestone was the Schick test in the context of Diphtheria, which played a vital role in the vaccination effort of the 1920s. In more recent years, diagnostic antibodies were critical in the detection of HIV and several other pathogens, including SARS-CoV-2.[2]

How diagnoses are made today

In order to make a diagnosis, medical staff collect information about the patient and their surroundings to filter what may be relevant for subsequent diagnosis based on predetermined criteria. Generally speaking, four methods can be used to gather holistic information.[3]

- Interviewing and establishing clinical history – When entering a dialog with patients, relevant information is gathered via both general and individual questionnaires. This communication approach is a developable skill and can be crucial in establishing a patient's baseline health characteristics like physical and psychological health.[3]

- Physical examination – On the basis of close visual observations, clinicians can get further information on the nature of a medical condition. Yet again, communication plays an important role in this step, since patients' feedback can direct the modality of immediate or future treatment.[3]

- Diagnostic testing – The field of diagnostic testing can be further divided based on the technology used to obtain information. Important categories of diagnostic testing include imaging technology and laboratory methods.[3]

- Consulting and referral – Clinicians regularly refer patients to colleagues or consult on cases in order to collect as much expertise as possible, with the aim to find and validate a diagnosis.[3]

Especially in the last century, the field of laboratory-based diagnostic testing has gained increasing importance in the overall diagnostic process. With the emergence of ultrasound, X-ray, MRI, and microscope instruments, clinicians have a wide and constantly evolving set of imaging techniques at their disposal.[4]

Laboratory techniques, on the other hand, are often based on blood or urine samples, with standardized tests and automated analyzers becoming increasingly important in laboratory routines. Many of these laboratory procedures take advantage of ever-advancing antibody technology, ELISA testing (Enzyme-linked Immunosorbent Assay) being a prominent example, allowing enormous progress in this field.[4]

Diagnostic testing – recombinant antibodies as the way forward

Antibody technologies already facilitate the diagnosis of various cancer types or infectious diseases today. Earlier in the development of these technologies, many diagnostic procedures relied on polyclonal antibodies – antibodies that are produced within specific organisms (like rabbits and goats) and subsequently extracted for use. However, polyclonal antibodies often lack batch-to-batch consistency and stable supply since they can only be exclusively produced by the specific and individual organism from which they originated.[5,6]

In the past few decades, monoclonal antibodies have become more established and therefore more requested for use in diagnostic procedures. Monoclonal antibodies are usually obtained from a single white blood cell and then multiplied in cell culture. The [production of recombinant monoclonal antibodies](#), on the other hand, occurs in vitro, which means that they are artificially produced in a laboratory, without the need for live animals.

Recombinant antibodies, by definition, provide elevated batch-to-batch consistency, as their manufacturing is based on genetic modification, which also permits high levels of customization. Their manufacturing can be more cost-intensive compared to non-recombinant monoclonal antibodies, since specially trained staff and equipment is required, but the benefits of a stable source of antibody that can be consistently produced in perpetuity far outweighs these costs. This is why recombinant antibody production is often outsourced to CROs and CDMOs like evitria AG that provide these specialized services to deliver recombinant antibodies to diagnostic tool developers.

Recombinant monoclonal antibodies are already a popular choice for several diagnostic applications, and it is likely that all diagnostic tools will use these antibodies in the near future.

Sources

- [1] <https://www.britannica.com/science/diagnosis#ref24607>
- [2] <https://www.si.edu/spotlight/antibody-initiative/diagnostics>
- [3] <https://www.ncbi.nlm.nih.gov/books/NBK338593/>
- [4] <https://www.britannica.com/science/diagnosis/Mental-examination#ref301324>
- [5] <https://www.linkedin.com/pulse/diagnostic-application-recombinant-antibodies-christian-eberle/?trk=pulse-article>
- [6] <https://www.evitria.com/journal/recombinant-antibodies/the-shortcut-to-reliable-diagnostic-control-and-assay-antibodies/>

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