Since the advent of Louis Pasteur’s germ theory in the 1860s, finding quick and accurate ways of identifying disease-causing pathogens has remained a priority for microbiologists worldwide. When Robert Koch created his postulates in 1884, in-vitro cultivation of microbes quickly became the gold standard microbial diagnostic method. But it was a slow and time-intensive process, so the need for more advanced methods persisted. Fortunately, great progress has been made in this field in recent decades—progress that has transformed the speed and accuracy of diagnostic microbiology today.

1970s
DNA-Based Testing

The concept of nucleic acid-based amplification technologies (NAATs) began formulation in the 1970s. However, as highlighted by Najafov and Hoxhaj in their book, *PCR Guru*, it was in the 1980s that the polymerase chain reaction (PCR) was created. Research has shown that this milestone permitted highly sensitive and specific detection of microbes using host DNA, and therefore eliminated the need for in-vitro cultures in clinical microbial diagnostics.

“The detection and identification of bacteria present in natural and industrial ecosystems are now entirely based on nucleic acid systems that detect microbial RNA or DNA. Culture methods were abandoned in the 1980s because direct observations showed that less than 1% of the bacteria in these systems grow on laboratory media.”

- J.W. COSTERTON, CENTER FOR GENOMIC SCIENCES, CENTER FOR GENOMIC SCIENCES,

1990s/2000s
Paradigm Shift in Scientific Understanding

The development of NGS in the 2000s moved microbial diagnostics firmly into the 21st century. With the ability to sequence entire bacterial genomes in a single sequence run or copy specific genes of interest—and even sequence the entire human genome in just one day, as noted by U.K. researchers Behjati and Tarpey—NGS was truly an industry game-changer. Most importantly, the data obtained from NGS provided a much-needed way for clinicians to obtain information on microbial resistance and virulence, as noted by Deurenberg et al in research published in the *Journal of Biotechnology*.

In 2017, MicroGen Vet launched into the veterinary market and became the exclusive reseller of NGS services from MicroGen DX to the global veterinary markets, including equine, small animal, livestock and exotic/zoo segments.

2008
Next Generation Sequencing (NGS)

MicroGen DX starts delivering NGS services in human healthcare

In 2008, innovative molecular diagnostic laboratory MicroGen DX developed an approach that combined a proprietary bioinformatics system and NGS to detect infectious diseases with high levels of sensitivity and specificity.

2019 and Beyond
What’s Next?

Beginning in 2019, MicroGen Vet plans to expand into global markets and to add biofilmatic products to its portfolio.