Antimicrobial resistance (AMR) is a well-established challenge that has a potentially catastrophic impact both in terms of human health and global economic performance. NovaBiotics, a UK-based biotech with an equal focus on antibacterials and antifungals, is taking a unique approach to addressing AMR in many ways.

NovaBiotics has developed a novel approach to the challenge of infection and AMR by addressing the problem from the host’s perspective and harnessing ‘AMR status-agnostic’ components of the innate immune system that normally deal with infection. In nature, antimicrobial peptides (AMPs) and aminothiols form the cornerstone of the body’s first line of defense against the spectrum of potentially harmful microbes with which people come into contact daily. NovaBiotics has developed platforms that can harness the beneficial properties of these natural, infection-fighting agents, which have already yielded novel classes of compounds that target a range of fungal, bacterial and polymicrobial infections. This ‘smart immunology’ approach has already been useful in other therapeutic conditions, most notably oncology and inflammation. Indeed, eight of the top fifteen best-selling drugs are immune-derived biologics.

Delivering first-in-class drug candidates
NovaBiotics’ AMP platform is generating novel, synthetic antibacterial and antifungal peptide drug candidates with membrane-targeted, rapidly microbicidal modes of action. These compounds are derived, but wholly distinct from endogenous AMPs. They share common, highly desirable properties with their endogenous AMP predecessors, including a rapid kill time and activity against a broad range of fungal, bacterial and polymicrobial infections, including multidrug-resistant pathogens, but are synthetic, therapeutically viable, novel peptide structures. While the use of such compounds as potential antimicrobials has been debated and anticipated for some time, the potential of AMP has not yet been fully realized. NovaBiotics has developed a novel approach to address the gap in the antibiotic toolbox by harnessing the innate immune system’s ability to fight infection. In nature, AMPs are derived, but wholly distinct from endogenous antimicrobials and aminothiols form the cornerstone of the body’s first line of defense against the spectrum of potentially harmful microbes with which people come into contact daily. NovaBiotics has developed platforms that can harness the beneficial properties of these natural, infection-fighting agents, which have already yielded novel classes of compounds that target a range of fungal, bacterial and polymicrobial infections. This ‘smart immunology’ approach has already been useful in other therapeutic conditions, most notably oncology and inflammation. Indeed, eight of the top fifteen best-selling drugs are immune-derived biologics.

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Pipeline and platform potential
“Drug candidates from both platforms have mechanisms of action that are agnostic to the antimicrobial resistance status of target pathogens and minimize, if not negate, the development of future acquired resistance,” said Deborah O’Neil, CEO of NovaBiotics. NovaBiotics has a track record in establishing successful commercial partnerships (its topical peptide antifungal for fungal nail infection, Novexatin, was outlicensed to Taro Pharmaceuticals in 2013, and an oral form of cysteamine for cystic fibrosis exacerbations was outlicensed to an undisclosed partner in 2016). “The deals we have done to date are focused on two very specific products from each of our platforms in niche indications and we are now shifting the emphasis towards the fact that we have developed more ‘mainstream’ antimicrobials from the two platforms. These are very commercially attractive products for use against Gram-negative and positive ESKAPE bacterial pathogens (peptides and cysteamine) and moulds and yeasts (peptides). The value of the platforms is worth more than the sum of their individual ‘parts’. Both sets of technology are highly complementary, but are wholly independent platforms,” O’Neil added.

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