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Protein engineering

by Heather Doran, Science Editor

Protein engineering is the creation of new amino acid sequences to modify proteins. There are many potential applications where the addition, deletion or modification of amino acids can aid or hinder enzyme efficacy. As our knowledge of genetics has expanded rapidly, so has our knowledge of how this might be applied in reality. Proteins are coded for by the 20 amino acids found in nature – should we limit our efforts to those 20 amino acids? This issue also looks at research which is trying to see if we can move beyond this 20-code language of proteins, could engineering offer us new amino acids and new protein functions?

Why do we need to do this? The world is under pressure to feed more people in more sustainable ways and treat people with medicine created more efficiently and sustainably. Protein engineering methods might help us reach this goal, producing more sustainable food possibly from unlikely sources, such as from pathogenic bacteria like *Yersinia pestis*, the causative agent of the plague which could help create lab-grown meat. Sustainable farming could be supported by protein engineering, reducing the carbon footprint of crops and supporting greater yields. I found it interesting that the human race has removed genetic diversity in our crops over time through farming techniques, so we now need to explore new ways of introducing diversity in order to make our crops work harder and be more resilient to pests and climate change.

There are many questions and challenges in this area and the articles explore just some of these. They also give you an insight into how this can be applied in reality.

As always, this issue also covers personal experiences in biochemistry for anyone interested in careers in the area check out the interviews, which includes interviews with two of the past 10 years' Colworth Medal winners, Professor Helen Walden and Dr Madan Babu, in celebration of the award's 60th anniversary, and write-ups of visits. I always love hearing about what people in the field do daily, as the roles and experiences people have in biochemistry can be so varied. ■



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