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Expanding the potential of mutasynthetic approaches for pseudomonic acids

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Polyketides are bioactive natural products and some of the most important medicines; they are synthesized by bacteria, fungi and some plants and represent an important group of structurally diverse and clinically useful compounds which include antibiotics like erythromycin and tetracycline, anticancer drugs and immunosuppressants. Re-engineering polyketide biosynthetic pathways for long has been a major objective, but a parallel approach is to join the products of different pathways. Thioamarinol is a hybrid between marinolic acid (a pseudomonic acid) and a pyrrothine, joined via an amide bond using gene cloning and mutagenesis to manipulate the biosynthetic genes of different polyketide systems (Mupirocin, Thiomarinol and Aminocoumarin), we explore ways to create other amines using both *P. fluorescens* NCIMB10586 which produces the pseudomonic acids that make up mupirocin and *P. alteromonas* SANK73390 that makes thiomarinol.

Our results shows that SimL (an amide ligase in an Aminocoumarin biosynthetic pathway) does not interfere with Mupirocin or Thiomarinol production, which makes it a strong candidate for creating hybrid compounds based on Mupirocin.

The outcome of the current experiments will determine to what extent Aminocoumarins can be used to combine independent antibiotic biosynthetic pathways and consequently aid in developing a new family of hybrid derivatives that may extend the effective use of mupirocin against *MRSA*.

Biography

Yusra Alsammarraie's first degree was in Zoology, and then she did a master's degree in Immunity and Infection in the University of Leeds, UK. Currently, she is a doctoral researcher at the University of Birmingham, UK.

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