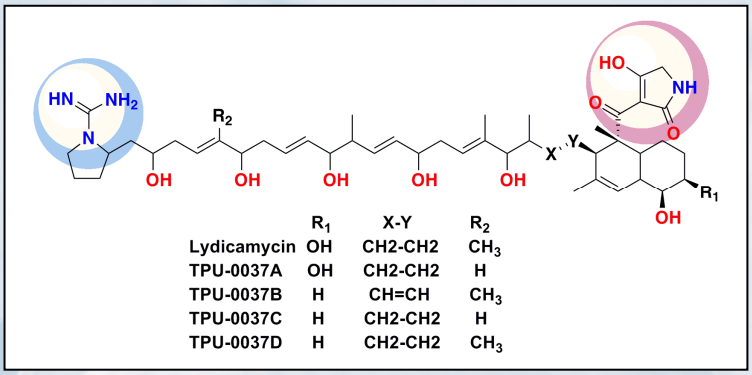
bioaustralis
fine chemicals

# Lydicamycins

## *Novel Antibiotic Scaffold*

In 1991, researchers at University of Toyko discovered a structurally novel antibiotic from *Streptomyces lydicus* and named the metabolite **lydicamycin**. Unlike many of the known antibiotic classes from Streptomyces, **lydicamycin** is not a macrocyclic lactone but rather a straight chain terminating at one end with a decalin bearing a tetramic acid and the other end bearing a basic amidinopyrrolidino moiety. **Lydicamycin** was selectively active against G+ve bacteria showing excellent activity against MRSA.




| | $R_1$ | X-Y | $R_2$ |
|---|---|---|---|
| Lydicamycin | OH | CH2-CH2 | $CH_3$ |
| TPU-0037A | OH | CH2-CH2 | H |
| TPU-0037B | H | CH=CH | $CH_3$ |
| TPU-0037C | H | CH2-CH2 | H |
| TPU-0037D | H | CH2-CH2 | $CH_3$ |

Almost 10 years later researchers at Toyama Perfectural University in Japan isolated **lydicamycin** as part of a complex of related analogues designated Antibiotic **TPU-0037A to D** isolated from *S. platensis*. Together the metabolites complete the set of known members of the **lydicamycin** class. Unusually in microbial metabolites, the class shows very limited structural variation at $C_8$ ($R_1$), $C_{30}$ ($R_2$) and unsaturation at $C_{14}$-$C_{15}$ (X…Y). Whether this lack of structural diversity reflects the rare occurrence of **lydicamycin** in nature and more are yet to be discovered, or reflects the restraints imposed by their respective mode of action is unknown. Like **lydicamycin**, the TPUs are G+ve selective and active against MRSA strains.

Curiously, a truncated **lydicamycin** bearing the decalin tetramic acid moiety, Antibiotic BU-4514N, was isolated from *Micromonspora* sp.. While the metabolite was shown to possess weak antibiotic activity it was shown to have powerful neuritogenic activity. Limited access to the **lydicamycins** has restricted a more thorough investigation of their pharmacology.

### Rare Microbes

Producers of **lydicamycin** are very rare with only 5 examples in our collection, occurring with an incidence of ~1 in 100,000 cultures. At BioAustralis we isolate **lydicamycin** from *Streptomyces* sp. MST-66492, an unidentified *Streptomyces* sp. culture isolated from land by Lake Bolac in South Australia and the TPUs are isolated from *Streptomyces* sp. MST-112218 isolated from swampy soil near Kingscote, also in South Australia.

### The Opportunities

The mode of action, selectivity of more modern resistant strains, analogue synthesis and structure-activity relationships, and interaction with other classes of antibiotics have never been investigated. An unusual structural scaffold deserving of more attention.


1. Lydicamycin, a new antibiotic of a novel skeletal type. I. Taxonomy, fermentation, isolation and biological activity. Hayakawa Y. et al. *J. Antibiot.* **1991**, 44, 282.
2. Lydicamycin, a new antibiotic of a novel skeletal type. II. Physico-chemical properties and structure elucidation. Hayakawa Y. et al. *J. Antibiot.* **1991**, 44, 288.
3. TPU-0037-A, B, C and D, novel lydicamycin congeners with anti-MRSA activity from *Streptomyces platensis* TP-A0598. Furumai T. et al. *J. Antibiot.* **2002**, 55, 873.
4. A new neuritogenic compound BU-4514N produced by *Microtetraspora* sp.. Toda S. et al. *J. Antibiot.* **1993**, 46, 875.


***Quality & value for money***

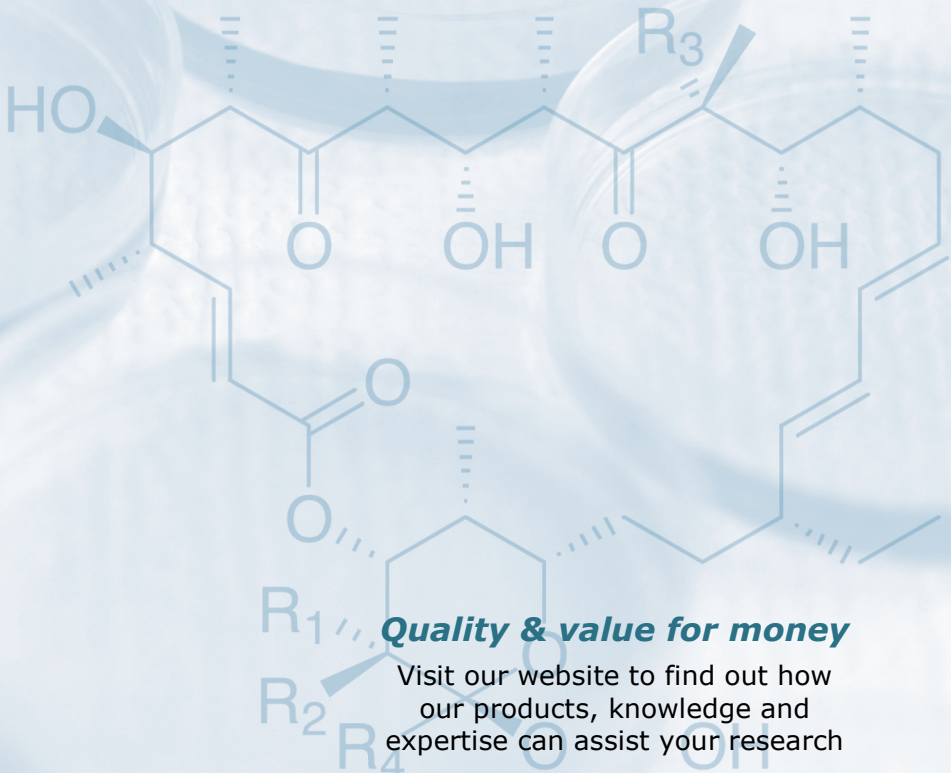
Visit our website to find out how our products, knowledge and expertise can assist your research


**Email: info@bioaustralis.com**

**Tel: +61 (0)2 9757-4515**

**Fax: +61 (0)2 9757-2585**

bioaustralis
fine chemicals




***Quality & value for money***

Visit our website to find out how our products, knowledge and expertise can assist your research

**Email: info@bioaustralis.com**

**Tel: +61 (0)2 9757-4515**

**Fax: +61 (0)2 9757-2585**

フナコシ株式会社
〒113-0033　東京都文京区本郷2丁目9番7号
http://www.funakoshi.co.jp/
e-mail　:　info@funakoshi.co.jp
試薬に関して : Tel.03-5684-1620　Fax 03-5684-1775
e-mail　:　reagent@funakoshi.co.jp
機器に関して : Tel.03-5684-1619　Fax 03-5684-5643
e-mail　:　kiki@funakoshi.co.jp

**www.bioaustralis.com**