

**Experiment title:**Threonyl-tRNA synthetase from *E.coli*, cocrystallized with its cognate tRNA**Experiment****number:**

LS-807

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Shifts: 3**Local contact(s):** Andrew Thompson*Received at ESRF:***1 SEP. 1997****Names and affiliations of applicants** (* indicates experimentalists):

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Report:

Threonyl-tRNA synthetase (ThrRS) is a class-II aminoacyl tRNA synthetase. The *E. coli* enzyme has been cocrystallized with its cognate tRNA and with the substrate ATP, which is necessary for the first step of the aminoacylation to proceed. Apart from its capacity to aminoacylate the isoacceptor tRNA^{Thr}s, the ***E. coli*** ThrRS has an interesting and very unusual property : it is able to bind its own messenger RNA, instead of the tRNA, and in this way to regulate its own synthesis.

Two crystal forms of the ThrRS-tRNA-ATP complex were encountered. One is trigonal and diffracts to about 3.5 Å, the other is hexagonal and diffracts to 2.8 Å, for the best crystals. The unit-cell parameters of the latter are $a=93$ Å, $c=488$ Å. Because of this very large cell parameter, the separation of the diffraction spots is difficult.

The measurements were made using the new MAR Research imaging plate of 345 mm, with a pixel to pixel distance of 100 µm. However, the available crystals had a weak diffracting power, and the effective resolution limit was not better than about 3.5 Å.

The necessary software for the large imaging plate is now available, and the diffraction images are being processed.