

## X-ray crystallography of aminoacyl-tRNA synthetases complexed with tRNAs

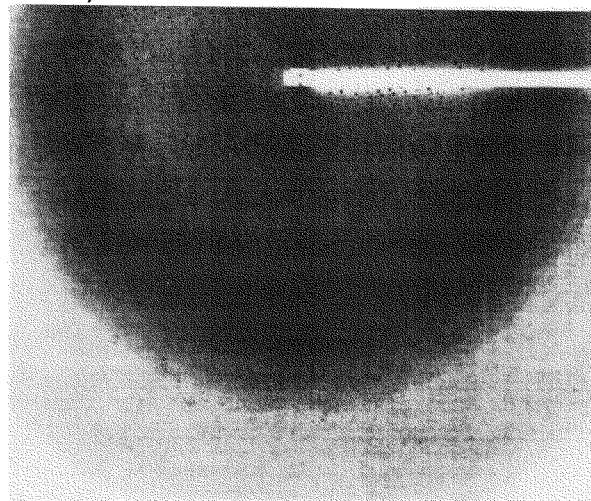
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### *T. thermophilus* valyl-tRNA synthetase complexed with tRNA

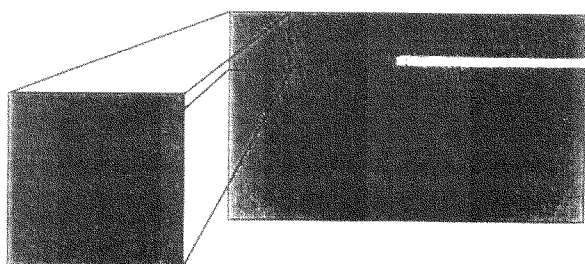
Valyl-tRNA synthetase (ValRS) specifically attaches L-valine to tRNA<sup>Val</sup>. ValRS misacylates minimally-distinct L-Thr, but hydrolytically edits its own misproducts upon binding with tRNA<sup>Val</sup>. To elucidate the mechanism of editing activation by tRNA, we have crystallized ternary complex of *T. thermophilus* ValRS, tRNA<sup>Val</sup>, and Val-AMP analogue. The crystals belong to spacegroup  $P4_2$  with extremely-large cell constants of  $a=b=410\text{\AA}$  and  $c=82.8\text{\AA}$ . In this beam time, we have collected the diffraction data upto  $2.8\text{\AA}$  resolution for  $180^\circ$  with oscillation angle of  $4^\circ$  ( $\lambda=1.0\text{\AA}$ , camera distance=500 mm, and Temp.=100K) (shown as below). However, the oscillation angle was so large that we had difficulty in the data processing.

$c=87.3\text{\AA}$ . In this beam time, we have collected the diffraction data upto  $2.4\text{\AA}$  resolution for  $60^\circ$  with oscillation angle of  $3^\circ$  ( $\lambda=1.0\text{\AA}$ , camera distance=500 mm, and Temp.=100K) (shown as below).



### *Drosophila* Sxl protein complexed with *tra* pre-mRNA

*Drosophila* Sxl protein regulates alternative splicing of *tra* pre-mRNA to determine the sex of fly. Sxl protein binds to intron polyuridine tract at the specific splice site on *tra* pre-mRNA, in order to interfere the splicingosome formation. To elucidate how Sxl protein specifically bind to the polyuridine sequence, we have crystallized Sxl protein complexed with 17 mer target RNA. The crystals belong to spacegroup  $I222$  with extremely-large cell constants of  $a=77.7\text{\AA}$ ,  $b=86.7\text{\AA}$  and  $c=160.1\text{\AA}$ . In this beam time, we have collected the diffraction data upto  $2.4\text{\AA}$  resolution for  $90^\circ$  with oscillation angle of  $6^\circ$  ( $\lambda=1.0\text{\AA}$ , camera distance=500 mm, and Temp.=100K).



### *T. thermophilus* arginyl-tRNA synthetase

Arginyl-tRNA synthetase (ArgRS) specifically attaches L-arginine to tRNA<sup>Arg</sup>. ArgRS catalyses the first step of aminoacylation (Arg-AMP synthesis) depending on the binding with tRNA<sup>Arg</sup>. To elucidate the mechanism of aminoacylation activation by tRNA, we first crystallized *T. thermophilus* ArgRS. The crystals belong to space group  $P6_5$  with cell constants of  $a=b=156\text{\AA}$  and