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APPENDIX A

AUC calculation

Linear trapezoidal rule

There are several methods for estimate the area under the concentration-time curve (AUC). Linear trapezoidal rule is one of those methods, which the simple calculation of AUC by the trapezoidal rule while other methods require more complex computations.

Linear trapezoidal rule assumes a linear relationship between observations. Consider the CsA whole blood concentration-time data of patient number 1, which is showed in first two columns of Table A-1. CsA levels (C) are determined at selected sampling times(t) over a dosing interval. To calculate the AUC, the trapezoidal area between each sampling time point is calculated. The equation for one such trapezoidal area between zero time and 1 hour is:

$$AUC_{0\text{-}1} = \frac{t_1 - t_0}{2} * (C_0 + C_1)$$

Since, the respective CsA levels are 187.79 and 510.30 ng/ml, it follows that:

$$AUC_{0\text{-}1} = \frac{1 - 0}{2} * (187.79 + 510.30)$$

$$= 349.045 \text{ ng*hr/ml}$$

The area under each time interval can be obtained in a similar manner. Then all trapezoidal areas are summed to yield the full AUC over a dosing interval.

Total AUC = Sum of the individual areas

The AUC calculations obtained from patients number 1 are displayed in Table A-1. In this patient the total AUC is 5735.04 ng*hr/ml

Table A-1 Calculation of total AUC using the linear trapezoidal rule

Time	Post-dose (hr)	CsA level (ng/ml)		Area under trapezoid (ng*hr/ml)
8.00	0	187.79		349.045
9.00	1	510.30		786.265
10.00	2	1062.23		1741.990
12.00	4	679.76		1542.345
15.00	7	348.47		321.095
16.00	8	293.72		994.300
20.00	12	203.43		
		Total AUC	=	5735.04

Vita

Ms. Thitima Kungsamrith was born on the eleventh of July in 1972 at Rajvithi Hospital, Bangkok. She earned her Bachelor Degree in Pharmaceutical Sciences (first class honors) in 1995 from the Faculty of Pharmaceutical Sciences, Chulalongkorn University. She is now a faculty member of Department of Pharmacy, Faculty of Pharmaceutical Sciences, Chulalongkorn University.