

SMR 1550 - 7

WORKSHOP ON THE USE OF RECEPTOR BINDING ASSAY (RBA)

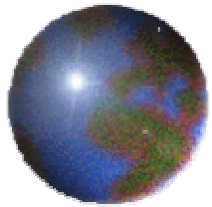
1 - 5 September 2003

Co-organized by the International Atomic Energy Agency (I.A.E.A.)

***STX Receptor Binding Assay:
Perspectives on Reagent Supply Issues***

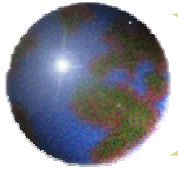
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These are preliminary lecture notes, intended only for distribution to participants.



*STX Receptor Binding Assay:
Perspectives on Reagent Supply
Issues*

Thomas Tissue
IAEA Consulting Expert



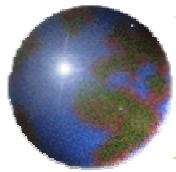
Critical Factors

✚ Reagents

- ✚ "Cold" saxitoxin (STX)
- ✚ "Cold" tetrodotoxin (STX)
- ✚ Tritium
- ✚ Tritiated water (high specific activity)

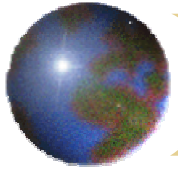
✚ Shipping and handling

- ✚ Regulations
- ✚ Facilities



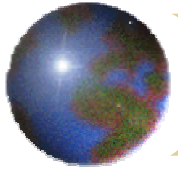
Tritiated Water

- ✚ High (58+ kCi/mol) activity and radio-toxicity if carrier-free
- ✚ Radiolytic decomposition by-products
- ✚ Usually generated in-situ
 - ▣ Catalytic oxidation
 - ▣ Spontaneous oxidation (1% per hour)
- ✚ Probably can not be shipped routinely carrier-free



Tritium

- ✚ Abundant
- ✚ Small quantities handled as solid metal chemisorbates (e.g., U and Ti titrides)
- ✚ Thermal release
- ✚ Readily available to labs providing custom tritiation services (IAEA need not supply)



Cold STX and TTX

❖ **Potential commercial sources and list prices**

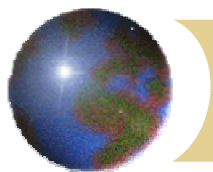
- ❖ Sigma Aldrich (USA) – STX @ \$106/10 µg, TTX @ \$192/1 mg; “bulk” orders of STX may be possible
- ❖ WEX Technologies (TTX, Canada) – price?
- ❖ Alexis (UK) – STX @ \$55/10 µg (ship to EU only)

❖ **Other potential sources**

- ❖ US FDA (R & D quantities) - gratis
- ❖ Philippines (STX) – price?
- ❖ Spain (STX, Viga?) – wholesale only?

❖ **Shipping**

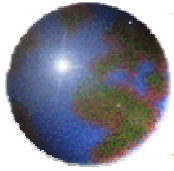
- ❖ by specialist firms easiest (\$\$\$)
- ❖ can not import and re-export after modification
- ❖ up to 5 mg apparently exempt from CBW controls
- ❖ derivatives and salts may be exempt



^3H – STX and TTX

Organization Contact Potential supplier of Quotation/List price Requirements

Organization	Contact	Potential source of	Quotation/List Price	Requirements
Amersham (UK)	website	Nada y nada		R.I.P
ANSTO (AU)	custservari@ansto.gov.au	tritium, 3h-STX	no interest	
BRITATOM (India)	vgr@britatom.com	tritium, 3H-STX	no response	
CNRC (CAN)	M. Quilliam	3H-STX	no interest	
U. - Arkansas (US)	R. Gawley	non-exch. 3H-STX, chemo-sensors	undergoing development	0.5 g STX (!)
Hartmann-Analytic (D)	V. Kay	3H-STX	\$4260/5 mCi	50 mg STX
Inst. Of Isotopes (H)	A. Hever-Szabo	tritium, 3H-STX	no interest	
IICH (US)	A. Susa'n	3H-STX	\$25,000/5 mCi	5 mg STX to associated Russian lab
Moravek (US)	P. Moravek	3H-STX	\$38,400/5 mCi	1 mg STX
MDS Nordion	various	3H-STX	under consideration (for months)	
PE/NEN (US)	Custom Services	3H-STX	interested;technical difficulties	
RC TRITEC (CH)	E. Bannwart	3H-STX	\$2000 to test label 100 microgram	100 micrograms STX
TOCRIS (UK)	S. Roome	3H-STX	no interest	
VITRAX (US)	R. Fazio	3H-TTX	test labelling run gratis	few hundred micrograms
VITRAX	R. Fazio	3H-STX	will explore at own expense	



Recommendations

- ✧ Conduct “supplier qualification trials”
 - ✧ Provide up to \$ 2K of cold STX to those potential suppliers requesting it
 - ✧ Send products to NOAA – Charleston for evaluation
 - ✧ For qualified suppliers: request quotations for 5 mCi of product of approx. same specs as Amersham’s former product
- ✧ Request quotations from Sigma and Alexis on 1 – 5 mg of STX
- ✧ Identify appropriate specialized shipping firms
- ✧ Encourage VITRAX to pursue ^3H – TTX
- ✧ Continue to explore non-exchangeable tritium labeling and, for the next generation, ^{35}S labeling