

Poster #33

Use of a Fiber Optic Biosensor to Demonstrate the Presence of an Estrogen Mimicking Substance in Pond Water Hosting Malformed Frogs.

Judith I. Erb,¹ Eric A.E. Garber,² Eric M. Priuska,¹ James L. Wittliff,³ and James G. Downward¹

¹IA Inc. and Threefold Sensors, Ann Arbor, MI, 48106.

²USDA-ARS Biosciences Research Lab., Fargo, ND 58105

³Univ. Of Louisville, KY 40292

Email: tfs-jerb@ic.net, Ph: (734) 995-9338 x20, FAX: (734) 995-6869

A new Minnesota site (HIB) has been identified having over 65% of malformed frogs. This 3-4 year old man-made pond is 5 feet deep, has no prior history of malformations and no agricultural activity near the site other than a small home plot of vegetables. Water from the pond was analyzed using a fiber optic sensor employing estrogen receptor as the sensing element. The water inhibited binding of the receptor to an optical fiber bearing an estrogen on its surface. The extent of this inhibition was comparable to that produced by water from another Minnesota site (ROI2) which was previously reported to exhibit a high degree of frog malformation. Water from a Minnesota pond which does not demonstrate frog malformations (DAR) produced no inhibition of binding between the receptor and sensor. The component which inhibited receptor binding to the sensor was subsequently captured by an affinity column to which receptor had been reversibly bound. Receptor was eluted from the column and both the fraction containing the flow through and the one which was eluted from the column along with the receptor were extracted with hexane in order to separate receptor from any hydrophobic compounds which might be bound to them. After being dried down and redissolved in distilled water, the flow through fraction did not suppress receptor binding to the sensor, while the fraction eluted with the receptor did. This indicates the presence in the pond water producing frog malformations of a compound which binds to the estrogen receptor.

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