

Novel Biosensor for the Diagnosis of Cervical and Other Cancers

Tech ID: 19813 / UC Case 2005-089-0

BACKGROUND

Carcinoma of cervix is the major malignancy of women. For cervical cancer diagnostics, there are about 55-million Pap smear tests performed every year in the United States. Pap smear screening for cervical cancer can result in 20% to 40% of false-negative results that lead to sometimes painful biopsies and put women at risk for pregnancy complications such as preterm labor and low-birth weight infants. Therefore there is a great need for a more accurate test of developmental stages of cervical cancers.

TECHNOLOGY DESCRIPTION

Src is a key molecule in oncogenesis and plays a major role in early development and progression of cervical and other types of cancer such as breast, colon, pancreatic, and lung. The novel biosensor developed by UCSD researchers combines FRET technology with genetically encoded biosensors which allows the monitoring of the Src tyrosine kinase activity in live cells, with high temporal and spatial resolutions. This innovation can potentially improve the sensitivity and accuracy for diagnosis of cervical cancer with Pap test samples.

APPLICATIONS

- Diagnosis of cervical cancer with Pap test samples as well as other types of cancers
- Combining with a standard Pap test to reduce the false-negative rate of cervical cancer diagnosis
- Screening of new anticancer drug candidates against cervical cancer at different developmental stages

STATE OF DEVELOPMENT

This technology has been further improved in the biosensor sensitivity, validated in cell culture and cervical biopsy samples.

OTHER INFORMATION

UCSD Researcher:

Dr. Chien, M.D., Ph.D., is University Professor and Director of the UCSD Whitaker Institute of Biomedical Engineering and former chair of the Jacobs School of Engineering's, Department of Bioengineering.

[Web site](#)

[Lab](#)

RELATED MATERIALS

- [Ouyang M., Sun J., Chien S., Wang Y. \(2008\) Determination of hierarchical relationship of Src and Rac at subcellular locations with FRET biosensors, Proc Natl Acad Sci USA. 105 \(38\):14353-58 - 09/17/2008](#)
- [Wang Y, Chien S. Analysis of integrin signaling by fluorescence resonance energy transfer. Methods Enzymol. 2007; 426: 177-201. - 01/01/2007](#)
- [Wang Y, Botvinick EL, Zhao Y, Berns MW, Usami S, Tsien RY, Chien S. Visualizing the mechanical activation of Src. Nature. 2005 Apr 21; 434 \(7036\):1040-5. - 04/21/2005](#)
- [Vascular Bioengineering Laboratory](#)

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OTHER INFORMATION

KEYWORDS

biosensor, diagnosis, diagnostics,
cancer, cervical, breast, biopsy, Pap
test, FRET, Src, kinase.

CATEGORIZED AS

- [Medical](#)
- [Diagnostics](#)

RELATED CASES

2005-089-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,114,581	02/14/2012	2005-089

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