California Science Center

# CALIFORNIA STATE SCIENCE FAIR

## 2001 PROJECT SUMMARY

**Your Name** (List all student names if multiple authors.)

**David A. Sanford**

**Science Fair Use Only**

**S0326**

**Project Title** (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

**A New Method to Indicate Gene Activation Within a Cell**

**Division**

**_ Junior (6-8) _X_ Senior (9-12)**

**Preferred Category** (See page 5 for descriptions.)

**3 - Biochemistry / Molecular Biology**

**Abstract** (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

I began this experiment with the intent of discovering a new method of indicating whether or not a cell was activated. I would measure the FRET (Fluorescence resonance energy transfer) that was being read by the FACS (Fluorescence-activated cell sorter) machine as I passed a cell culture through it. I hypothesized that by using a stimulated sample (YKID+CKIX Forskolin) that I would be able to separate the cells that were FRETing enough to have the gene within them considered activated and those that were not. I began by running the protocol to check that my control samples of the cells (CFP, YFP, CFP+YFP mixture, and CY fusion) were correct and followed the same results of previous experimentation. Then, I proceeded in preparing samples of a Y+C Forskolin (stimulated) and passed it through the FACS machine. The YC fusion sample had the highest level of FRET because the two cells were joined together and were activated; also, the YKID+CKIX had a low level of FRET and was not considered to be activated. I hypothesized that the Y+C Forskolin would fall as a divider between these two samples. As the data showed, the Y+C Forskolin did fall as a divider between the YKID+CKIX mixture and the YC fusion sample.

**Summary Statement** (In one sentence, state what your project is about.)

A new method to indicate the activation of a gene within a human cell.

**Help Received in Doing Project** (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Under supervision of Dr. Marc Montminy, Dr. Bernhard Mayr, and David Chambers (Flow Cytometrist).