

Notes from the MAF

Monoclonal Antibody Facility
University of Georgia

MAF Holiday Planner

Ruth Davis

Only 71 shopping days until Christmas!! I know everyone is *dying* to be reminded of that! But, we're even closer to the UGA Thanksgiving and Christmas holidays... This will be the last MAF newsletter before the new calendar year. We'd like to take this opportunity be sure everyone is up-to-date on MAF holiday closings, especially if you have an ongoing project or were thinking of starting one!

First, if you have ongoing activities at the MAF, we will continue boosting and bleeding mice on our regular schedule, regardless of the

holidays. Also, Animal Resource personnel will be working through the holidays to insure that your animals receive the same qual-



Happy

Halloween

ity care that is provided during regular working days. The MAF lab, however, will follow the UGA holiday schedule.

Over the Thanksgiving holidays, one person will come in every day to monitor any cell lines and the equipment. I will be checking my email, so if you have any questions over that weekend, try email—rdavis@vet.uga.edu.

For the December schedule, the MAF will close at 5:00 PM on 21 December (Friday) and will reopen at 8:00 AM

(Continued on page 3)

Antibody Production—Recombinant Technology

Dr. Chakravarthy Chennareddy

The hybridoma methodology for developing monoclonal antibodies has been developed by Kohler and Milstein in 1975 (1). This is straightforward protocol and still a protocol of choice for high yield of monoclonals for diagnostic and various cell biology techniques.

The recombinant gene technology has given options to manipulate genetic make up

and transfer novel genes into a biological system and even their expression. This recombinant technology adapted to antibody production has various advantages over traditional hybridoma technology as it greatly reduces antibody generation time, minimizes the use of animals, produces antibodies with greater target binding affinity which can be intended for use as thera-

peutic antibodies (antibodies as drugs) and offers greater functional control over production system (being wholly *in vitro*).

Several different recombinant techniques can be used to develop and refine a particular antibody, but **phage display technique** dominates the arena. In phage display, genes of antibodies,

(Continued on page 2)

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In this issue:

MAF Holiday Planner	1
Antibody Production—Recombinant Technology	1
Just For Fun	3
Web contact information	4

Special points of interest:

- MAF Holiday Planner—schedule in this issue!
- Options in Antibody Production Technology
- MAF newsletter will be released quarterly with news and information. Next issue in January, 2009.
- New documents for FY08 now available on the web



Antibody Production—Recombinant Technology (cont.)

(Continued from page 1)

either isolated from immunized individuals, naïve individuals, or existing libraries, are into the phage DNA. Then the phage infects *Escherichia coli* and produces large quantities of antibody. Phage particles secreted into the culture are incubated with the target antigen, and those that bind are isolated, expanded, and purified. This avoids screening large numbers of clones and saves time. This is also the dominant technology for naive selections—trying to get a first antibody. Using phage technology, antibody fragments can be generated for some carbohydrate groups on cell surfaces, tumor markers (2).

Another cell-free, totally *in vitro* technology—**Ribosome Display**—can also be used for production of monoclonal antibodies. Here, a population of mRNA molecules tran-

scribed from antibody genes is incubated with bacterial ribosomes and translated in a cell-free system. The protein mixture, when run through an affinity column with the desired antigen, leaves desired proteins bound while others are washed away. This method creates much larger libraries than other methods, all without cloning. Some techniques use a combined phage display and ribosomal display analysis.

The antibody genes are also inserted into yeast, baculovirus, and mammalian cell lines and expressed *in vitro* with a good control. The knowledge about the genome of these cell lines and their culture characters in defined media allows researchers to choose among expression systems for specific purposes (3,4).

Though recombinant technology is available for the production of monoclonal antibodies, relatively few antibody libraries

are commercially available to date, because of intellectual property rights that have encumbered the technology.

1. G. Kohler and C. Milstein, "Continuous cultures of fused cells secreting antibody of predefined specificity," *Nature*, 256:495, 1975.
2. S. Sidhu, ed., *Phage Display in Biotechnology and Drug Development*, CRC Press, 2005.
3. R. Verma et al., "Antibody Engineering: comparison of bacterial, yeast, insect, and mammalian expression systems", *J Immunol Methods*, 216:165-81, 1998.
4. F. Crawford et al., "use of baculovirus MHC/peptide display libraries to characterize T-cell receptor ligands", *Immunol Rev*, 210:156-70, 2006.

MAF Holiday Planner (cont.)

(Continued from page 1)

2 January 2008! All in-progress cell lines will be frozen and stored during this time. Personnel will come in regularly to check equipment status, especially the liquid

nitrogen inventory, but will not be available by telephone or email except in the case of an animal emergency. We will look forward to hearing from you on the 2nd of January (Wednesday).

As for the newsletter, we'll see

you NEXT YEAR! Thank you for your patronage of the MAF!



Just for Fun...

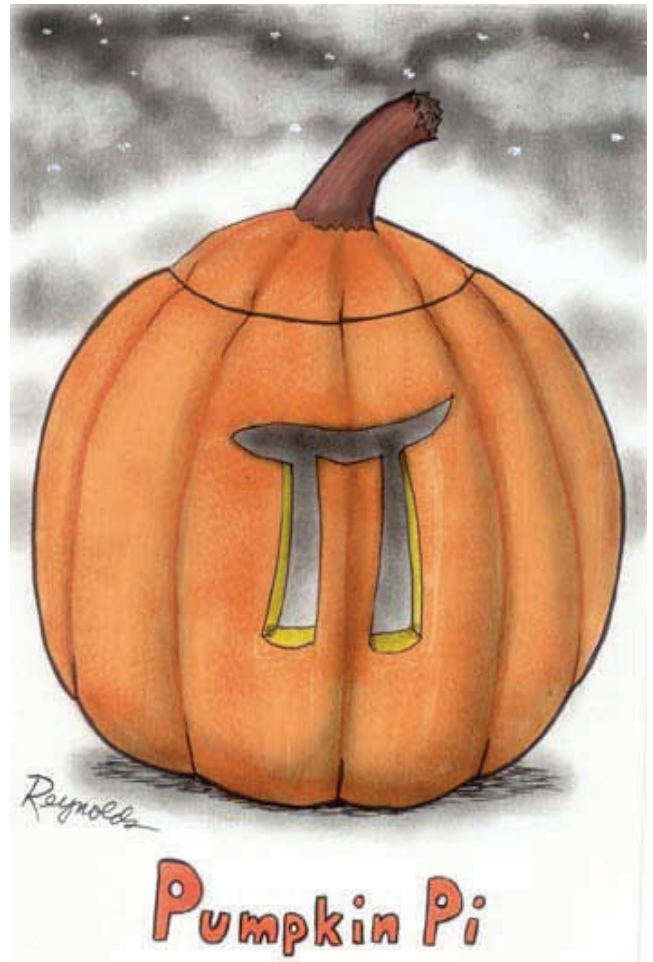
Have a

Happy

Holiday

Season!

The MAF.





*Custom antibodies
to benefit your
research.*

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A UGARF Core laboratory, dedicated to the development and production of custom antibodies for more than 20 years. Let us help you to develop your cutting-edge ideas!

[HTTP://WWW.VET.UGA.EDU/
ANIMALRESOURCES/
MONOCLONAL/](http://www.vet.uga.edu/animalresources/monoclonal/)

New Project Request forms available on the web—
See our site at:

[http://www.vet.uga.edu/animalresources/
monoclonal/](http://www.vet.uga.edu/animalresources/monoclonal/)

We can do mouse polyclonal serum development,
but for rabbit polyclonal information, see:

[http://www.franklin.uga.edu/casar/Polycone/
Info%20Sheets.htm](http://www.franklin.uga.edu/casar/Polycone/Info%20Sheets.htm)