



Penicillin in the Vein



By Robert LaPerriere, MD

This article is adapted from a presentation at a recent Sacramento County Historical Society event on "A Taste of History."

THROUGH A CHANCE OBSERVATION IN 1928, Alexander Fleming discovered that colonies of *Penicillium* mold growing in his bacterial cultures were able to stave off infection (due to the production of an antibacterial molecule known as penicillin). The name *Penicillium* comes from penicillus, or brush, based on the brush-like appearance of the fruiting structures.

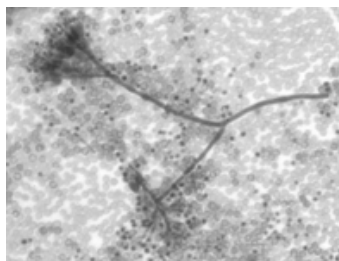
Penicillin and other betalactam antibiotics (named for an unusual, highly reactive lactam ring) have few side effects apart from allergic reactions in some people, because the penicillin attacks a process unique to bacteria and not found in higher organisms. The enzymes attacked by penicillin are found on the outside of the cytoplasmic membrane surrounding the bacterial cell, so the drugs can attack directly without having to cross this strong barrier.

Penicillium notatum produces penicillin.

Penicillium roqueforti produces blue cheese.

Penicillium glaucum produces bleu cheeses including Gorgonzola and Stilton.

Penicillium candidum produces white mold cheese and a white rind in some cheeses.



The spores in *Penicillium* often contain blue or green pigments which give the colonies in cheese their characteristic color. The three most common blues are Roquefort (from France, 1070 AD), Gorgonzola (879 AD from Italy) and Stilton (from England, 18th Century).

Another blue cheese, Maytag, was developed in 1941 and is made in Iowa by members of the washing-machine family, which also produces Anchor Steam Beer in San Francisco. Another variety is Danish blue cheese.

More local blue cheeses would include Pt. Reyes Original Blue by Point Reyes Farmstead Cheese Company and a blue cheese by Cowgirl Creamery. The earliest production of blue cheese west of the Mississippi was in 1956 by Rogue Valley Creamery in Oregon. There are well over 70 varieties of blue cheese.

Until quite recently, the process of introducing mold to these cheeses was left to Mother Nature. Blocks of Roquefort were actually held in ancient caves where the mold lived! Today the mold spores are usually mixed with the milk or the curd during cheese making. Enzymes in the mold that eat and digest milk fat are responsible for the unique flavor of blue cheese. Over time, the mold penetrates the cheese causing "veins" to form and the cheese to become crumbly.

Roquefort is made from sheep's milk, although other blues around the world are made from the milk of cows and goats. Maytag is made with cow's milk and *Penicillium roqueforti*. The Roquefort name can only be used legally for cheese made by the traditional method in a specific place.

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1. Photo: A *Penicillium* mold from a bleu cheese, cultured and photographed by Editorial Committee member Dr. Gordon L. Love

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