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remarkable because of the ordering of the liquid at the solid–liquid interface. It is accepted that a liquid in contact with a planar solid shows out-of-plane ordering — the liquid atoms form layers parallel to the surface of the solid[6]. This might be thought to favour crystallization of the liquid, but whether or not this is so depends on the nature of the atomic ordering within each layer (in-plane ordering), the characterization of which has proved challenging[7]. In-plane ordering is exactly what would be expected when a liquid comes into contact with a substrate that acts as a template for crystal nucleation in freezing.

Schülli *et al.*[1] have succeeded in the difficult task of characterizing in-plane order in the liquid gold–silicon alloy adjacent to the 6 × 6 silicon surface. They found that the liquid is anisotropic, with atomic positions strongly correlated with the structure on the underlying surface. It is remarkable that this correlation with a periodic surface pattern impedes the crystallization of the liquid, rather than inducing it.

The researchers[1] also characterized the structure of the gold–silicon liquid away from the silicon substrate and found that, in common with most metallic liquids[8], it shows icosahedral short-range order that becomes more pronounced on cooling. Crucially, the authors observed that the pentagonal clusters of atoms typical of the icosahedral order seem to be stabilized by similar pentagonal arrangements in the 6 × 6 silicon superstructure (see Fig. 4 on page 1177). However, when the alloy droplets freeze on the 6 × 6 silicon surface, the resulting gold crystals form in random orientations. This suggests that the substrate has no orienting role in freezing; the actual site and mechanism of crystal nucleation remain undetermined.

For several years, there has been intense interest in attaining a large supercooling effect of liquids before the onset of freezing. To avoid crystal nucleation caused by contact with a solid, the favoured strategy is to process the liquid without using a container. This can be done in various ways[9], including by levitating liquid drops electromagnetically, electrostatically or acoustically, or by studying drops as they fall through a tube or tower. Because the surface energies of most liquids are lower than those of the crystals that form from them[10], free surfaces — in these experiments, the liquid surfaces at air–liquid interfaces — also stabilize the liquid state of levitating or free-falling drops. The work of Schülli *et al.*[1], however, opens up an attractive alternative to dispensing with the container: why not just disguise the container's surface as a liquid? ■

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INFECTIOUS DISEASE

Listeria does it again

Julian I. Rood

Proteins are synthesized by ribosomes, and then commonly undergo further modifications. A new example of how these host-cell processes can be subverted by a pathogenic bacterium has come to light.

There are many ways by which pathogenic bacteria produce the cell and tissue damage that leads to human disease. On page 1192 of this issue Ribet *et al.*[1] reveal another such mechanism — they show that *Listeria monocytogenes* can alter an essential host-cell biochemical pathway, and potentially decrease the ability of the host to respond to infection.

The development of an infectious disease is a tactical war between the attacking armaments of the invading pathogen and the defence mechanisms of the host. With some pathogens a single potent virulence factor will suffice. With others the host cell has to counter many different factors, as is the case when the cell is attacked by *L. monocytogenes*. This food-borne bacterium can cause several diseases, including gastroenteritis, septicaemia and meningitis, and also miscarriage[2]. It produces several virulence factors that enable it to invade host cells, and to grow and multiply within them. The complexity of this process makes it a model bacterial pathogen for understanding the infectious-disease process, from both a host and a pathogen perspective. Examples of discoveries stemming from the study of *L. monocytogenes* (Fig. 1) include the determination of the role of extracellular toxins in bacterial escape from the phagolysosome (the bactericidal vacuole of the invaded host cell),

50 & 100 YEARS AGO

50 YEARS AGO

This article describes a model which imitates certain aspects of morphogenesis and maintenance in a developing embryo. The model consists of a number of artificial 'cells' (constructed from radio parts) which can stimulate and inhibit one another by means of connexions which are made through a switchboard. The pattern of activity generated, representing the growth pattern, was found to bear a remarkable resemblance to certain aspects of morphogenesis ... Many other properties of our system, with larger numbers of cells and with other ways of connecting them together, are reminiscent of the properties of growing embryos: for example, the patterns are in general homeostated — a disturbance producing only a temporary change in the pattern. Discrete differences (such as 'on' or 'off') appear between neighbouring cells, in contrast to the continuous differences which would be expected on a purely humoural mechanism of growth control.

Dr. R. J. Goldacre and A. D. Bean

From *Nature* 23 April 1960.

100 YEARS AGO

In her letter to NATURE on March 24 Miss I. Sollas remarks on the "canary-yellow" colour "in members of the stoat family when the winter whitening is incomplete," adding, "there can thus be little doubt that the yellow body produced artificially in the fur of the albino rat is a substance similar to the yellow pigment of the stoat's winter coat ..." I do not know whether it has been recorded ... that a stoat's fur of the purest white will, after exposure to light in a museum case for a time, varying with the intensity of the light, invariably turn distinctly yellow — fainter, however, than "canary-yellow." ... The usual reason assigned for the change is the absorption by the hairs of a small amount of fat out of the skin, induced by the light and heat of summer.

Henry O. Forbes

From *Nature* 21 April 1910.