RESEARCH PAPER ANALYSIS

GYMNOSPERM TISSUE CULTURE: A RARE SUCCESS

The paper in this issue by Pramod Gupta and Don Durzan (University of California, Davis) on somatic polyembryony in sugar pine describes one of the few successes in generating somatic embryos, and in large number, in gymnosperm tissue culture. Furthermore, the team's suspension cultures were derived from embryos excised from mature seeds that had been stored for nearly five years.

Most successes in gymnosperm culture have been in the promotion of shoot formation (organogenesis), usually on explanted cotyledons. Since these shoots typically form in bunches and without roots, each shoot must be individually separated and removed to a rooting medium. Many shoots do not root readily, and those that do must then be moved through a series of repottings and changes in environment until they can be put out in the field. It is a labor-intensive process and therefore expensive.

The forestry industry, always interested in breeding and propagating elite species, has supported extensive tissue culture efforts for a good many years. Trial plantings that aim to speed up propagation and reduce cost are already in place.

Somatic embryogenesis in conifers (as in all plants) offers the potential of large numbers of embryos, all separate from each other; roots already part of the structure because there is a natural division of labor as embryos differentiate; and dormancy induction in the embryos and/or encapsulation for efficient storage and delivery to the forest. The elucidation of

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REASONS

Cytochemical attributes of somatic embryos (e) and suspensors (s) of sugar pine. Acetocarmine staining of callus mass reveals the origin of embryos, which contain cells that have large nuclei and a strong affinity for the stain.

proper procedures for initiation and growth of the proembryonic suspensions must go hand-in-hand with the development of the bioreactor and delivery technologies.

From a purely biological perspective, the white, mucilaginous callus that ultimately produces the somatic embryos is also of interest. Similar tissue has been observed in the early passages of cereal suspension cultures

that form somatic embryos (such as maize). Both conifers and cereals are difficult to grow and regenerate in culture, and most successes have been with tissue derived from excised immature embryos. Determining the nature and possible role of these cells and their mucilage may help elucidate the factors that induce or promote embryonic development.

—Philip V. Ammirato

RESEARCH FUNDING

GLASGOW TO FORM A HUMAN LEUKEMIA CENTER

Glasgow—A Human Leukaemia Virus Centre, the first of its kind in the world, is being established here at the University of Glasgow. Supported by funds of almost £2 million over the next five years, it will be located in the department of veterinary pathology, where William Jarrett has carried out his pioneering work over the past two decades on feline leukemia.

Following the demonstration by Jarrett and his colleagues that leukemia in cats is usually associated with a retrovirus, the researchers found that the same virus is a major cause of an immunosuppressive AIDS-like syndrome in cats. The center's formation comes soon after the incrimination of

a related agent in one form of human leukemia, the pinpointing of HTLV-III/LAV as the agent of human AIDS, and suspicions that further retroviruses may be responsible for multiple sclerosis and other conditions. Directed by David Onions, the center's research program will bring together epidemiology and molecular biology. The Glasgow University Leukaemia Research Group, the largest in Britain working on oncogenic viruses, has already produced a successful vaccine against feline leukemia virus (FeLV), and is collaborating with Robert Gallo of the U.S. National Cancer Institute (Bethesda, MD) on the development of a vaccine

against human AIDS.

"It is marvelous to see the fruits of the work of the past 20 years on animal viruses combining with the modern technologies of molecular biology to lead the search forward in the field of human leukemia viruses," says Jarrett, who has worked in Glasgow throughout his career. Construction to accommodate the new center should be completed next spring, at which time a team of 10 people will be recruited. One of the first aims is to apply genetic engineering techniques to investigate human leukemias that occur in clusters, the significance of which is unknown to epidemiologists.

—Bernard Dixon