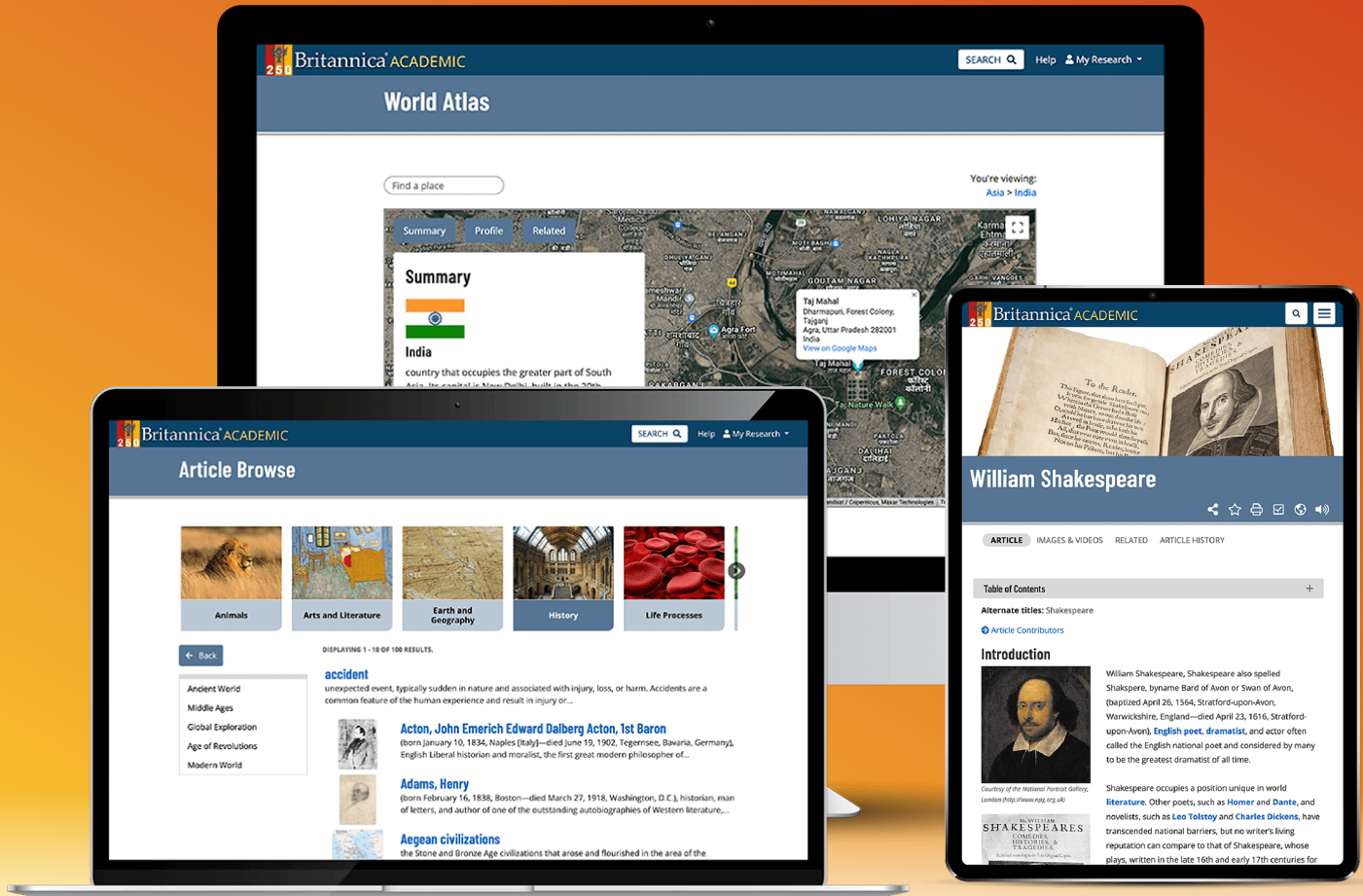


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## tissue culture

ARTICLE IMAGES & VIDEOS RELATED ARTICLE HISTORY

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### Introduction



Tissue culture, a method of biological research in which fragments of **tissue** from an animal or plant are transferred to an artificial environment in which they can continue to survive and function. The cultured tissue may consist of a single **cell**, a population of cells, or a whole or part of an **organ**. Cells in culture may multiply, change size, form, or function; exhibit specialized activity (muscle cells, for example, may contract); or interact with other cells.

### Historical developments

An early attempt at tissue culture was made in 1885 by German zoologist **Wilhelm Roux**, who cultivated tissue from a chick embryo in a warm salt solution. The first real success came in 1907, however, when American zoologist **Ross G. Harrison** demonstrated the growth of frog nerve cell processes in a medium of clotted lymph. French surgeon **Alexis Carrel** and his assistant **Montrose Burrows** subsequently improved upon Harrison's technique, reporting their initial advances in a series of papers published in 1910–11. Carrel and Burrows coined the term **tissue culture** and defined the concept. Thereafter, a number of experimenters succeeded in cultivating animal cells, using as culture media a variety of biological fluids, such as lymph, blood serum, plasma, and tissue extracts. In the 1980s and '90s, methods were developed that enabled researchers to successfully grow mammalian embryonic **stem cells** under artificial conditions. Those breakthroughs ultimately enabled the establishment and maintenance of human embryonic stem cell lines, which advanced researchers' understanding of human biology and greatly facilitated progress in **therapeutics** and **regenerative medicine**.

### Culture environments

Cells may be grown in a **culture medium** of biological origin such as blood serum or tissue extract, in a chemically defined synthetic medium, or in a mixture of the two. A medium must contain proper proportions of the necessary nutrients for the cells to be studied and must be appropriately acid or alkaline. Cultures are usually grown either as single layers of cells on a glass or plastic surface or as a suspension in a liquid or **semisolid medium**.

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