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PATENTS AND LITERATURE

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The objective of this section is to keep readers aware of significant inventions and trends in industrial research as well as to highlight those areas of reserch that may lead to new biotechnological opportunities. Four major areas of biochemistry will be covered, corresponding to enzymes, cells, bioproducts, and nucleic acids. In this issue, both the patent and literature sections focus on cell studies. The entries are listed in alphabetical order by the first author's name. The section on patents will be compiled from the international patent literature. The name(s) of the inventor(s), patient number, date of filing, assignee, and a short descriptive of the invention will be given. Copies of the US patents can be obtained for $1.00 each from the Commissioner of Patents and Trademarks, Washington, DC 20231.

Cells

I. Patents

J 57115189 (Jul. 17, 1982), Ajinomoto, K. K.

L-Methionine is produced by reacting methanol or betaine and homocysteine with *Pseudomonas, Microticulus,* or *Methylomonas* genera.

Boisman, T. A. B., Bailley, M. L.; EP 54987 (Jun. 30, 1982), Shell Int. Res., Mij, B. V.

Microbial transformation of a water-immiscible organic substrate is obtained by using a microorganism on a porous, water-bearing, particulate inert support.

Cheetham, P. S. J.; GB 2081305 (Feb. 17, 1982), Tate & Lyle Ltd.

Carbohydrates are converted into EtOH with immobilized bacterial cells (e.g., *Zymomonas mobilis*) under conditions that prevent growth of the cells. The medium is nutritionally inadequate for cell growth.

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Cheetham, P. S. J.; GB 2098236 (Nov. 17, 1982), Tate & Lyle, P. L. C.

Enzyme-containing cells are immobilized in a calcium alginate gel and then contacted with glycerol. The gel-immobilized cells can be stored and transported in the presence of glycerol.

Czula, J., Spieler, R.; WP 8203971 (Nov. 25, 1982), Lavery, d. & Son Pty; Csula, J.

Low-fat cheese is produced with cultures of *Lactobacillus bulgaricus, Streptococcus thermophilus,* and *Lactobacillus casei.*

Deloach, J. R., Harris, R. L., Ihler, G. M., Mayer, R. T.; US 4327710 (May 4, 1982), US Sec. of Agriculture.

Pesticides, enzymes or drugs are encapsulated in resealed erythrocytes. First, the erythrocytes are dialyzed in a hypotonic solution and then mixed with solution which contains the additive.

BE 892523 (Jul. 16, 1982), Inst. Microbiologia

Cells with glucose isomerase activity are immobilized by coupling to blood serum or plasma with glutaraldehyde.

Lambe, C. A., Rosevear, A.; GB 2096169 (Oct. 13, 1982), UK Atomic Energy Auth.

Biological production of chemical compounds is obtained by maintaining viable cells in close proximity by immobilization in a gel.

This process can be used to induce plant cells to produce steroid drugs, alkaloid drugs, natural biocides or natural colorants, flavors or aromas, or to induce animal cells to produce antibodies or other proteins.

Lantero, O. J.; US 4355105 (Oct. 19, 1982), Miles Laboratories Inc.

Enzyme-producing microorganisms are immobilized by successive treatment with glutaraldehyde and polyethyleneimine.

Lazar, I.; RO 73891 (Jul. 30, 1982), Inst. Petrol. Gaze; Inst. Stiinte Biologice.

A presence-resistant vessel is claimed for growing anaerobic bacterial cultures that become adapted to petroleum deposit conditions. The pressure conditions that are achieved can be close to those in the petroleum deposit into which the bacteria are to be injected.

Lim, F.; BE 892477 (July 1, 1982), Damon Corp.

Microcapsules are ruptured to liberate encapsulated cells by treatment with an anionic polymer and a sequestering agent.

Lim, F., Jarvis, A. P.; BE 892478 (Jul. 1, 1982), Damon Corp.

Cells that require surface fixation are cultured by microencapsultation with culture medium. This process is most suitable for the production of interferon with fibroblasts.

Lim, F.; BE 892479 (Jul. 1, 1982), Damon Corp.

Encapsulated cells are used for the biosynthesis of active substances. A semipermeable membrane surrounds the cells and controls the diffusion of compounds and prevents contamination.

Mattiasson, B. G.; WP 8204264 (Dec. 9, 1982), Alfa-Laval AB; Mattiasson, B. G.

Biochemical data are obtained on microorganisms by immobilizing on a specific sorbent and measuring metabolism. This process can be used to count cells of a particular microorganism or for quantitative determination of vitamins or antibiotics.

Mimura, A. Yuasa, K., Shibukawa, M.; EP 54800 (Jun. 30, 1982), Asashi kasei Kogyo.

Immobilized microorganism gel of high strength and activity is produced by adding the cells to an aqueous solution of acylamidomethyl gp. that contains starch and comonomer. Then the mixtrue is polymerized. The material may be used for the production of malic acid with *Brevibacterium ammoniagenes*, which has fumarase activity, L-tryptophan with *Escherichia coli*, which has tryptophanase activity, semisynthetic cephalosporins with *Bacillus megaterium*, which has penicillin acylase activity, antibiotics such as bacitracin with *Bacillus licheniformis*, and amino acids with *Microbacterium ammoniaphilum*.

Mosbach, K., Nilsson, K. G. C.; WP 820660 (March 4, 1982), Corning Glass Works, Misbach, K. H., Nilsson, K.

Immobilization of anchorage-dependent cells is obtained by adsorption on a microcarrier (esp. protein or polysaccharide) that is enzymatically degradable without significant destruction of cell surfaces.

Munir, M.; DE 3038219 (Apr. 15, 1982), Suddeutsche Zucker.

Isomaltulose is a sugar substitute intermediate produced by enzymatic conversion of pure sucrose solutions with immobilized cells of isomaltulose-producing microorganisms.

Nakai, M., Ohshima, T., Kimura, T., Omata, T., Iwamoto, N.; EP 43211 (Jan. 6, 1982), Ube Industries KK.

Optically active L-tryptophan derivatives are prepared by reacting DL-tryptophan amide derivatives with a culture of a microorganism that produces amidase preferentially hydrolyzing the L-amide.

BE 890811 (Feb. 15, 1982), Region Wallonne.

Cells are immobilized on a solid, negatively charged, support in a liquid aqueous medium by modifying the zeta potential of the cell and/or of the support. The process is cheap, involves simple adsorption and does not harm the physiological condition of the cells. The number of cells per gram of support is increased.

Sefton, M. V.; US 4353888 (Oct. 12, 1982), Sefton, M.V.

Viable mammalian cells are encapsulated in a membrane of polymer that prevents passage of antibodies. Encapsulated pancreatic islets cells can be introduced into a host animal to produce insulin.

Strobel, G. A., Gavlak, A. H., Haynes, J. M.; EP 64720 (Nov. 17, 1982), Montana State Univ.; Res. & Dev. Inst. Inc.

A *Rhizobium* inoculant is used for increasing nodulation, root mass, and shott mass in a leguminous plant.

J 57059813 (Apr. 10, 1982), Takeda Chemical Ind. KK.

Alpha-glucosidase inhibitor contains Valienamine that is isolated by treating Validamycin A, B or Validoxylamine A with *Pseudomonas denitriphycans*.

Tysyachnay, I. V., Yabovleva, V. I., Berezin, I. V.; SU 922142 (Apr. 25, 1982), Tysyachnaya, I. V.

Citrobacter freundii 62 cells with beta-tyrosinase activity are immobilized on polyacrylamide gel in the presence of ammonium acetate, sodium pyruvate, or tyrosine.

Watanabe, I., Sakashita, K., Ogawa, Y.; FR 2488908 (Feb. 26, 1982), Nitto Chem. Ind. KK.

Acrylamide is prepared from acrylonotrile in an aqueous salt-free medium by the action of a microorganism with nitrilasic activity. *Corynebacterium* and *Nocardia* are immobilized in a cationic polymer gel based on acrylamide.

Wolf, H. J.; US 4353987 (Oct. 12, 1982), Upjohn Co.

The methanol dehydrogenase in immobilized cells of *Methylobacterium organophilum* NRRL B-12486 (ATCC 17886) is used to produce glyceraldehyde from glycerol.

II. Literature Survey

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