U.S. Patents (25)

5,000,000*	Ethanol Production by *Escherichia coli* Strains Co-expressing *Zymomonas pdc* and *adh* Genes, L.O. Ingram, F. Alterthum, T. Conway (1991)
5,028,539	Ethanol Production using Engineered Mutant *Escherichia coli*, L.O. Ingram and D.C. Clark (1992)
5,162,516	Cloning and Sequencing of the Alcohol Dehydrogenase II from *Zymomonas mobilis*, L.O. Ingram and T. Conway (1992)
5,424,202	Ethanol Production by Recombinant Hosts, L. O. Ingram, D. S. Beall, G. F. H. Burchhardt, W.V. Guimaraes, K. Ohta, B. E. Wood, K. T. Shanmugam, D.E. Fowler, A. Ben-Bassat (1995)
5,482,846	Ethanol Production by Gram-Positive Microbes, L.O. Ingram and M.D.F. Barbosa-Alleyne (1996).
5,602,030	Recombinant Glucose Uptake System, L.O. Ingram, N. Arfman, and J. Snoep (1997).
5,821,093	Recombinant cells that highly express chromosomally-integrated heterologous genes, L. O. Ingram, K. Ohta, and Brent E. Wood (1998).
5,916,787	Ingram, L.O. and M.D.F. Barbosa-Alleyne. Ethanol production in gram-positive microbes (1999).
6,102,690	Recombinant organisms capable of fermenting cellobiose L.O. Ingram, X. Lai, M. Moniruzzaman and S.W. York. (2000).
6,107,093	Recombinant cells that highly express chromosomally-integrated heterologous genes. L. O. Ingram, K. Ohta, and B. E. Wood (2000).
6,130,076	Ethanol production using a soy hydrolysate-based medium or a yeast autolysate-based medium. L.O. Ingram and S.W. York. (2000).
6,333,181	Ethanol production from lignocellulose. B.E. Wood and L.O. Ingram (2001).
6,849,434	Ethanol production in recombinant hosts. L.O. Ingram and M.D.F. Barbosa-Alleyne (2005)
7,026,152	Method and compositions for simultaneous saccharification and fermentation. LO Ingram and S. Zhou. (2006)
7,098,009	Production of chemicals from lignocellulose, biomass, or sugars. K.T. Shanmugam, L.O. Ingram, M.A. Patel, M.S. Ou, R. Harbucker(2006)
7,192,772	Recombinant cells that highly express chromosomally-integrated heterologous Gene. Ingram LO, K Ohta, and BE Wood (2007)
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7,323,551	Cloning and sequencing of pyruvate decarboxylase (PDC) genes from bacteria and uses therefor. Maupin-Furlow, JA, LA Talarico, RK Chandra and LO Ingram (2008)
7,629,162	Materials and Methods for Efficient Lactic Acid Production. S. Zhou, L.O. Ingram, K.T. Shanmugam, L.P. Yomano, T.B. Grabar, and J.C. Moore (Dec 2009)
7,977,075	Materials and Methods for the Efficient Production of Acetate and Other Products. L.O. Ingram, T.B. Causey, S. Zhou, and K.T. Shanmugam. (7/12/2011)
8,124,259	Enhanced electrical contact to microbes in microbial fuel cells. Andrew Rinzler, L.O. Ingram, J.C. Moore, Zhuangchun Wu, K.T. Shanmugam. (2/28/2012)

8,383,374	Materials and Methods for the Efficient Production of Acetate and Other Products. L.O. Ingram, T.B. Causey, S. Zhou and K.T. Shanmugam (02/26/2013)
8,426,191	Escherichia coli B Engineered for Lactic Acid Production. L.O. Ingram, K.T. Shanmugan, L.P. Yomano, S. Zhou, T.B. Grabar, and J.C. Moore (04/23/2013)
8,465,953 B2	Ethanol Production in Non-Recombinant Hosts. Y. Kim, K.T. Shanmugam, L.O. Ingram (06/18/2013)
8,691,539	Materials and methods for efficient succinate and malate production. Kaemwich Jantama, Mark John Haupt, Xueli Zhang, Jonathan Christopher Moore, KT Shanmugam, LO Ingram (4/8/2014)

*US Department of Commerce chose to award this Landmark Patent to the invention that used bacteria to convert biomass to ethanol.

Pending U.S. patents (23), and awarded foreign patents (10) are not included.