

Microbiome research is uncovering the enormous potential for developing drugs, such as live biotherapeutic products, from the microbiome. This burgeoning field is the future of medicine.

List Labs is excited and proud to support microbiome research by providing reagents to scientists studying the human microbiome. Below is a list of microbiome research studies that have used List Labs' research reagents such as Athrax, Pertussis, Cholera and Difficile Toxins.

Pertussis Toxins Used in Microbiome Research

Products #180 – Pertussis Toxin from *B. pertussis*, Lyophilized in Buffer and **#181** – Pertussis Toxin from *B. pertussis*, Lyophilized (Salt-Free) have been used in the study of regulation of autoimmune myocarditis by host responses to the microbiome.

Product #179A – Pertussis Toxin from *B. pertussis* (in Glycerol) has been used in the study of bidirectional association between the gut microbiota and CNS disease in a biphasic murine model of multiple sclerosis.

Products #180 – Pertussis Toxin from *B. pertussis*, Lyophilized in Buffer and **Product #181** – Pertussis Toxin from *B. pertussis*, Lyophilized (Salt-Free) were used in the study of CD44 deletion leading to attenuation of experimental autoimmune encephalomyelitis results from alterations in gut microbiome in mice.

Products #180 – Pertussis Toxin from *B. pertussis*, Lyophilized in Buffer and **#181** – Pertussis Toxin from *B. pertussis*, Lyophilized (Salt-Free) have been used to study the effect of omeprazole on the development of experimental autoimmune encephalomyelitis in C57BL/6J and SJL/J mice.

Products #180 – Pertussis Toxin from *B. pertussis*, Lyophilized in Buffer and **#181** – Pertussis Toxin from *B. pertussis*, Lyophilized (Salt-Free) have been used to study an intestinal commensal symbiosis factor controls neuroinflammation via TLR2-mediated CD39 signalling.

Products #180 – Pertussis Toxin from *B. pertussis*, Lyophilized in Buffer and **#181** – Pertussis Toxin from *B. pertussis*, Lyophilized (Salt-Free) have been used to show a commensal bacterial product elicits an modulates migratory capacity of CD39(+) CD4 T regulatory subsets in the suppression of neuroinflammation.

Products #180 – Pertussis Toxin from *B. pertussis*, Lyophilized in Buffer and **#181** – Pertussis Toxin from *B. pertussis*, Lyophilized (Salt-Free) have been used to show dominant effects on the diet on the microbiome and the local and systemic immune response in mice.



Difficile Toxins Used in Microbiome Research

Product #152C – Toxin A from *Clostridium difficile* and product #155 – Toxin B from *Clostridium difficile* were used in researching Immunogenicity and protective efficacy of recombinant *Clostridium difficile* flagellar protein FliC.

Product #152C – Toxin A from *Clostridium difficile* and product #155 – Toxin B from *Clostridium difficile* were used in researching an in vitro culture model to study the dynamics of colonic microbiota in Syrian golden hamsters and their susceptibility to infection with *Clostridium difficile*.

Cholera Toxins Used in Microbiome Research

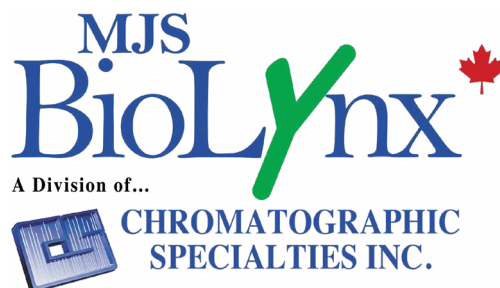
Product #103B Cholera Toxin B Subunit (Choleraegenoid) from *Vibrio cholerae* and product #104 – Cholera Toxin B Subunit (Choleraegenoid) from *Vibrio cholerae* in Low Salt were used to study the immunogenicity and effects on fecal microbiome of an electron-beam inactivated rhodococcus equi vaccine in neonatal foals.

Product #103B Cholera Toxin B Subunit (Choleraegenoid) from *Vibrio cholerae* and product #104 – Cholera Toxin B Subunit (Choleraegenoid) from *Vibrio cholerae* in Low Salt were used to study the effects of administration of live or inactivated virulent *Rhodococcus equi* and age on the fecal microbiome of neonatal foals.

Product #101 – Cholera Toxin from *Vibrio cholerae* was used in research finding that parental dietary fat intake alters offspring microbiome and immunity.

Anthrax Products

Product #171 – Anthrax Protective Antigen (PA), Recombinant from *B. anthracis* was used in research finding that substrate cleavage profiling suggests a distinct function of bacteroides fragilis metalloproteinases (fragilysin and metalloproteinase II) at the microbiome-inflammation-cancer interface.



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