

The use of DAT for immunotherapies

Desaminotyrosine (DAT) is a microbial metabolite produced during bacterial flavonoid metabolism and has been shown to protect intestinal barrier integrity and promote regeneration of intestinal stem cells during allogeneic hematopoietic stem cell transplantation (allo-HSCT). DAT activates key cellular pathways to reduce graft-versus-host disease (GvHD) while enhancing graft-versus-leukemia (GvL) responses, improving transplant outcomes and minimizing complications through specific metabolite formulations as adjunct therapies in allo-HSCT.

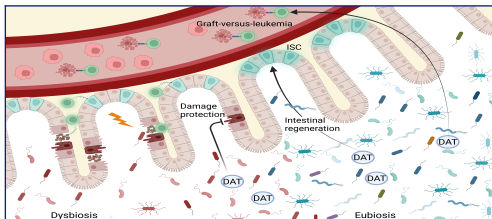


Possibility of GvHD prevention by microbial metabolites

There is growing interest in microbiome-derived metabolites for immunotherapy and tissue regeneration. As a metabolite, DAT supports allo-HSCT treatment with a novel therapeutic approach.

REFERENCES:

-  Publication Nature (2024)
-  Publication Nature (2025)



The microbial metabolite DAT, produced by a healthy microbiome or supplemented as a synthetic metabolite, protects the intestinal epithelium from damage and promotes intestinal regeneration via intestinal stem cells. Systemically, it promotes effector function of T cells and promotes graft-versus-leukemia responses.



- 01** Supports development of precision microbiome therapies based on metabolite production or encapsulation
- 02** Optimizes microbiota-shaped T-cell therapies like CAR-T and immune checkpoint inhibitors
- 03** Mitigates GvHD severity and relapse via microbiome modulation
- 04** Metabolite-based prediction of patient outcomes post-allo-HSCT

CHALLENGE

Immunotherapies are crucial for cancer prevention and treatment but remain limited in efficacy. Allogeneic hematopoietic stem cell transplantation (allo-HSCT) can cure many otherwise incurable hematological cancers, yet success is constrained by severe graft-versus-host disease (GvHD) and the persistent difficulty of reliably predicting survival and relapse after allo-HSCT.

INNOVATION

The invention improves allo-HSCT outcomes by leveraging the microbiome and its metabolites to modulate graft-versus-host disease (GvHD) while preserving graft-versus-leukemia (GvL) effects. Integrated analyses in allo-HSCT patients identified a microbiome signature correlating with immuno-modulatory metabolites (IMMs) and improved survival, summarized by the Immuno-modulatory Metabolite Risk Index (IMM-RI). Preclinical data show DAT promotes intestinal regeneration and balances GvL/GvHD via mTORC1- and STING-dependent pathways.

01 Basic principles observed · **02** Technology concept formulated · **03** Experimental proof of concept · **04** Technology validated in lab · **05** Technology validated in relevant environment · **06** Technology demonstrated in relevant environment · **07** System prototype demonstrated in operational environment · **08** System complete and qualified

TRL 08
TRL 07
TRL 06
TRL 05
TRL 04
TRL 03
TRL 02
TRL 01

Technology Readiness Level (TRL)



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