

Comparison of Cytokine Transgenics for Improved Myeloid Lineage Reconstitution



Several super immunodeficient models expressing cytokines designed to drive myeloid cell lineage commitment have been generated. Explore the features of each model in the comparison table below.

Model	huNOG-EXL	Humanized NSG-SGM3 (or hu-CD34-SGM3)	Humanized MISTRG
Strain	hGM-CSF/hIL3-NOG	NSG TM -SGM3	MISTRG
Also Known As	IL3/GM-Tg	NSGS	-
Nomenclature	NOD.Cg- <i>Prkdc</i> ^{scid} <i>Il2rg</i> ^{tm1Sug} Tg(SV40/HTLV-IL3,CSF2)10-7Jic/JicTac	NOD.Cg- <i>Prkdc</i> ^{scid} <i>Il2rg</i> ^{tm1Wjl} Tg(CMV-IL3,CSF2,KITLG)1Eav/MloySzJ	C;129S4- <i>Rag2</i> ^{tm1Flv} <i>Csf1</i> ^{tm1(CSF1)Flv} <i>Csf2</i> / <i>Il3</i> ^{tm1.1(CSF2,IL3)Flv} <i>Thpo</i> ^{tm1(TPO)Flv} <i>Il2rg</i> ^{tm1.1Flv} Tg(SIRPA)1Flv/J
Background	NOG (NOD strain background)	NSG TM (NOD strain background)	Mixed BALB/c x 129S4
Cytokines Expressed (Other Modifications)	Human GM-CSF (CSF2) Human IL-3	Human GM-CSF (CSF2) Human IL-3 Human KITLG (SF)	Human GM-CSF (CSF2) Human IL-3 Human M-CSF (CSF1) Human TPO <i>Human SIRPa</i>
Cytokine Levels	hGM-CSF ~35 pg/ml hIL-3 ~80 pg/ml ¹	hGM-CSF, hIL-3 and hKITLG ~2000-4000 pg/ml ⁹	Not reported
Promoter	SV40	CMV	All under endogenous mouse promoters except GM-CSF under human promoter.
Increase In Myeloid Cells Over Base Model	~3 fold relative to NOG ¹	~1.5 to 5 fold relative to NSG ³⁻⁴	~9 fold compared to Rag2/Il2rg null and ~6 fold compared to NSG ⁸
Lifespan Unengrafted	Expected normal lifespan	Expected normal lifespan	Not reported
Lifespan After CD34+ HSC Engraftment	Up to 7 months reported. High chimeric ratio mice develop anemia after engraftment. ²	Up to 4 months reported. Mice develop severe, eventually fatal anemia after engraftment. ⁵⁻⁷	3 weeks after engraftment reaches 10-20% chimerism in peripheral blood if pre-conditioned with irradiation (~10-12 weeks post-engraftment); lifespan may be prolonged by using less potent stem cells, lower cell numbers, or avoiding pre-conditioning. ⁸
Other Comments	Stable engraftment through lifespan of mouse	Loss of human graft after 3-4 months ⁵	
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1 Ito R, Takahashi T, Katano I, Kawai K, Kamisako T, Ogura T, Ida-Tanaka M, Suemizu H, Nunomura S, Ra C, Mori A, Aiso S, Ito M. (2013) Establishment of a human allergy model using human IL-3/GM-CSF-transgenic NOG mice. *J Immunol*. 191(6):2890-9.
2 Personal communication, Takeshi Takahashi, CIEA, and results of studies at Taconic.
3 Miller PH, Cheung AM, Beer PA, Knapp DJ, Dhillon K, Rabu G, Rostamirad S, Humphries RK, Eaves CJ. (2013) Enhanced normal short-term human myelopoiesis in mice engineered to express human-specific myeloid growth factors. *Blood*. 121(5):e1-4.
4 Billerbeck E, Barry WT, Mu K, Dörner M, Rice CM, Ploss A. (2011) Development of human CD4+FoxP3+ regulatory T cells in human stem cell factor-, granulocyte-macrophage colony-stimulating factor-, and interleukin-3-expressing NOD-SCID IL2Ry(null) humanized mice. *Blood*. 117(11):3076-86.
5 5th International Workshop on Humanized Mice, workshop discussion.

6 Wunderlich M, Stockman C, Devarajan M, Ravishanker N, Sexton C, Kumar AR, Mizukawa B, Mulloy JC. (2016) A xenograft model of macrophage activation syndrome amenable to anti-CD33 and anti-IL-6R treatment. *JCI Insight*. 1(15):e88181.
7 Yoshihara S, Li Y, Xia J, Danzl N, Sykes M, Yang YG. (2019) Posttransplant Hemophagocytic Lymphohistiocytosis Driven by Myeloid Cytokines and Vicious Cycles of T-Cell and Macrophage Activation in Humanized Mice. *Front Immunol*. 10:186.
8 Rongvaux A, Willinger T, Martinek J, Strowig T, Gearty SV, Teichmann LL, Saito Y, Marches F, Halene S, Palucka AK, Manz MG, Flavell RA. (2014) Development and function of human innate immune cells in a humanized mouse model. *Nat Biotechnol*. 32(4):364-72.
9 The Jackson Laboratory website: www.jax.org/strain/013062
10 The Jackson Laboratory website: www.jax.org/strain/017712

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