**COMPREHENSIVE IMMUNODEFICIENT SUITE**

### NOD scid gamma (NSG™)  
**Name & Stock Number**: NOD.Cg-Prkdc<sup>scid</sup> Il2rg<sup>tm1Wjl</sup>/SzJ (005557)

<table>
<thead>
<tr>
<th>Mature B cells</th>
<th>Absent</th>
<th>Absent</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mature T cells</td>
<td>Absent</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Dendritic Cells</td>
<td>Defective</td>
<td>Defective</td>
<td>Absent</td>
</tr>
<tr>
<td>Macrophages</td>
<td>Defective</td>
<td>Defective</td>
<td>Defective</td>
</tr>
<tr>
<td>Natural killer cells</td>
<td>Absent</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Complement</td>
<td>Absent</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Leakiness</td>
<td>Very low</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Irradiation tolerance</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Lymphoma incidence</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Benefits**
- Engrafts the widest range of solid and hematological cancers, including ALL and AML
- Most sensitive host for cancer stem cells when compared to NOD scid or nude mice
- Longer lifespan than NOD scid; supports long-term engraftment studies and capabilities; >89 weeks median survival
- Long-term multilineage hematopoietic stem cell repopulation similar to NSG™ mice
- Engrafts human PBMC without irradiation similar to NSG™
- Engrafts a wide range of solid and hematological cancers
- Increased CD4+ FoxP3+ regulatory T cell population
- Enhanced human myelopoiesis and terminal differentiation,
- Increased efficiency of engrafting human acute myeloid leukemia (AML)

**Considerations**
- No thymic lymphomas—can be used for long and short-term experiments
- Sensitive to irradiation
- No thymic lymphomas—can be used for long-term experiments
- Requires higher dose of irradiation to obtain human HSC engraftment
- Compromised human stem cell regeneration
- Suppression of human erythropoiesis
- Reduction of human B-lymphopoiesis

**References**
- Ishikawa et al. 2005 (PMID: 15920010)  
  - Shultz et al. 2005 (PMID: 15879151)  
  - Pearson et al. 2008 (PMID: 18785974)
  - Brehm et al. 2010 (PMID: 20096637)  
  - Maykel et al. 2014 (PMID: 24798996)

**NOD rag gamma (NRG)**  
**Name & Stock Number**: NOD.Cg-Rag<sup>1tm1Mom</sup> Il2rgtm1Wjl/SzJ (007799)

**NOD scid gamma IL3, GM-CSF, SCF (NSG-SGM3)**  
**Name & Stock Number**: NOD.Cg-Prkdc<sup>scid</sup> Il2rg<sup>tm1Wjl</sup>/SzJ Tg(CMV-IL3,CSF2,KITLG)1Eav/MloySzJ (013062)

**Name & Stock Number**: J:NU (007850)  
**Name & Stock Number**: NU:J (002019)
<table>
<thead>
<tr>
<th>MODELS</th>
<th>MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOD scid</td>
<td>BALB scid</td>
</tr>
<tr>
<td>NOD.CB17-Prkdc&lt;sup&gt;scid&lt;/sup&gt;/J (001303)</td>
<td>CBBySmn.CB17-Prkdc&lt;sup&gt;scid&lt;/sup&gt;/J (001803)</td>
</tr>
<tr>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Defective</td>
<td>Present</td>
</tr>
<tr>
<td>Defective</td>
<td>Present</td>
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<tr>
<td>Defective</td>
<td>Present</td>
</tr>
<tr>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Very low</td>
<td>Very low</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>High (thymic lymphoma)</td>
<td>High (thymic lymphoma)</td>
</tr>
</tbody>
</table>

- Higher take-rates for slow-growing cancer cell lines than BALB scid or nude xenograft models
- Xenotransplantation of some solid human tumors
- Adoptive transfer from strains on NOD background enables study of cell function & track cell movement
- Develops thymic lymphomas by 8-9 months—best used in short-term experiments
- Sensitive to irradiation

- Allows allogeneic and xenogeneic cancer cell lines & tissues
- Engrafts hematopoietic cancer cell lines, some primary cells
- Improvements in engraftment efficiency over nude models for some cancer cell lines
- Innate immunity intact
- NK cell activity limits engraftment
- Sensitive to irradiation

- Radiation resistant, providing an alternative to scid mutants
- Adoptive transfer from strains on B6 background permits to study cell function and track cell movement
- Innate immunity intact
- Poor host for primary cell transplantation

- Engraftment of human & mouse tumor cell lines
- Easy assessment of subcutaneous tumor growth due to lack of fur
- Innate immunity intact
- Little engraftment of hematopoietic cancer cells
- Not suitable for primary cell transplantation

Shultz et al. 1995 (PMID: 7995938)  
Nonoyama et al. 1993 (PMID: 8473734)  
Mombaerts et al. 1992 (PMID: 1547488)