Compartment in Cell Renewal Systems

Progenitor
- Stem Cells
- Production of initial cell divisions

Maturational
- Maturation-Division
- Maturation only

Functional
- Cells fully mature (differentiated)
- No Cell Division
- Finite Lifespan

Death
## Turnover Time in Various Tissues

<table>
<thead>
<tr>
<th>Tissue</th>
<th>Cell Type</th>
<th>Turnover Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>RBC</td>
<td>120 days</td>
</tr>
<tr>
<td></td>
<td>Granulocytes</td>
<td>10 hours</td>
</tr>
<tr>
<td></td>
<td>Platelets</td>
<td>10 days</td>
</tr>
<tr>
<td></td>
<td>Lymphocytes</td>
<td>up to many years</td>
</tr>
<tr>
<td>Gastrointestinal. Tract</td>
<td>Oral Cavity</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td>Stomach</td>
<td>3-9 days*</td>
</tr>
<tr>
<td></td>
<td>Small intestine</td>
<td>2 days</td>
</tr>
<tr>
<td></td>
<td>Colon</td>
<td>4-6 days</td>
</tr>
<tr>
<td>Skin</td>
<td>Epithelium</td>
<td>13-100 days*</td>
</tr>
<tr>
<td>Respiratory Tract</td>
<td>Tracheal epithelium</td>
<td>50 days</td>
</tr>
<tr>
<td></td>
<td>Lung alveolar cells</td>
<td>10-30 days</td>
</tr>
<tr>
<td>Urinary Bladder</td>
<td>Epithelium</td>
<td>50 days</td>
</tr>
<tr>
<td>Testes</td>
<td>Male germinal epithelium</td>
<td>74 days</td>
</tr>
<tr>
<td>Eye (cornea)</td>
<td></td>
<td>7 days</td>
</tr>
</tbody>
</table>

*depending on site.
A

Absorptive enterocytes
Enteroendocrine
Goblet cells

Differentiated villus cells

Mesenchyme

Proliferating progenitors

Crypt intestinal stem cells
Crypt Paneth cells
Pericryptal fibroblasts
Kinetics of cell renewal in bone marrow

- Progenitor
- Maturation-Division
- Maturational Only
- Functional

- Myeloblast → Myelocyte 6 days
- Metamyelocyte → BM Granulocyte 4 days
- Blood Granulocyte 10 hours
- Tissue Granulocyte

- "Pluripotential" Stem Cell
- Proerythroblast → Poly'e'blast 4 days
- Orthoe'blast → Reticulocyte 1 day
- Red Blood Cell (Erythrocyte) 120 days

- Megakaryoblast 5-10 days
- Granulocytic Megakaryocyte 5 days
- Mature Megakaryocyte
- Platelet 10 days
ACCIDENTAL RADIATION EXCURSION AT THE OAK RIDGE Y-12 PLANT—IV

Fig. 1.
Incidence of sickness and death due to acute exposure to various doses of nuclear radiation.
UNCLASSIFIED
QRNL-LR-DWG. 41433-A

1. Observe and Record Time of Onset of Clinical Signs and Symptoms.

- Nausea, Vomiting, Diarrhea Within Minutes and Ataxia, Disorientation, Shock, Coma in Minutes to Hours

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Injury Group V

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Injury Groups I, II, III, IV

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Injury Group I

- Nausea and/or Vomiting and Some Derangement of Blood Count Within 2 Days

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Injury Groups II, III, IV

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Injury Group II

- Marked Leucocyte and Lymphocyte Count Derangement in 3 Days

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Injury Groups III, IV

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Injury Group III

- Diarrhea Within 4 Days and Marked Platelet Derangement Within 6 to 9 Days

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Injury Group IV

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GROUP | DOSE
-----|------
I    | 0-150 rem
II   | 150-400 rem
III  | 400-1000 rem
IV   | 1000-2000 rem
V    | > 10,000 rem

PRELIMINARY EVALUATION OF RADIATION INJURY