S5 Table. Similarities amongst prior independent observations of PrP- and PSA-NCAM-related phenotypes

<table>
<thead>
<tr>
<th>Phenotype</th>
<th>PrP-related observations</th>
<th>PSA-NCAM related observations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. circadian rhythm</strong></td>
<td>a. ko mice exhibit altered circadian rhythm under continuous darkness [1]</td>
<td>critical for intact free-running circadian rhythmicity under continuous darkness [3,4]</td>
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<tr>
<td><strong>2. mossy fiber pathfinding</strong></td>
<td>ko mice exhibit pathfinding defect of infrapyramidal bundle, causing it to run underneath pyramidal cell layer [6]</td>
<td>NCAM ko mice and ST8SIA2 ko mice exhibit pathfinding defect of infrapyramidal bundle, causing it to run underneath pyramidal cell layer [7, 8, 9]</td>
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<tr>
<td><strong>3. neurogenesis</strong></td>
<td>observed within adult subventricular zone in neuroblasts; its presence promotes their differentiation into mature neurons [10]</td>
<td>marker of adult neurogenesis research; observed within adult subventricular zone in neuroblasts [11,12,13]</td>
</tr>
<tr>
<td><strong>4. LTP and voltage-gated ion channels</strong></td>
<td>a. ko mice exhibit deficits in LTP [14,15,16]</td>
<td>promotes LTP [19]</td>
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<td></td>
<td>b. promotes AMPARs [17]</td>
<td>promotes AMPARs [20]</td>
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<td></td>
<td>c. restricts activity of NMDARs [18]</td>
<td>restricts activity of NMDARs [21]</td>
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<tr>
<td><strong>5. hematopoietic stem cells (HSCs)</strong></td>
<td>a. not found on totipotent embryonic stem cells (ESCs) but expressed on HSCs [22]</td>
<td>not found on totipotent embryonic stem cells but expressed on HSCs [26]</td>
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<tr>
<td></td>
<td>b. ko mice exhibit impaired HSC self renewal [23]</td>
<td>ST8SIA4-ko mice exhibit 30% lower levels of thymocytes [27]</td>
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<td></td>
<td>c. expression is high in monocytes dendritic cells (DCs), T- and B-lymphocytes and natural killer cells (NK) [24]</td>
<td>expression is high in monocytes and NK cells; as monocytes differentiate into DCs, the substrate for PSA attachment shifts from NCAM to neuropilin [28,29]</td>
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<td></td>
<td>d. neuropilin is a candidate PrP interactor [25]</td>
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<tr>
<td><strong>6. myelin repair</strong></td>
<td>a. expressed on axon and non-myelinating Schwann cells [30]</td>
<td>expressed on axons and non-myelinating Schwann cells [31,32]; implicated in regeneration of lesioned or chemically demyelinated peripheral nerves [32,33,34,35]</td>
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<tr>
<td></td>
<td>b. ko causes peripheral neuropathy characterized by a myelin maintenance defect [30]</td>
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<tr>
<td><strong>7. dentin abnormalities</strong></td>
<td>ko mice exhibit dentin structure defects [36]</td>
<td>NCAM levels in progenic dental pulp correlate with number of dentin producing active odontoblasts [37]</td>
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<tr>
<td><strong>8. resistance to Brucella</strong></td>
<td>may contribute to the cellular uptake of bacteria belonging to the <em>Brucella</em> family [38,39]</td>
<td>adherence of <em>Brucella</em> bacteria to human epithelial cells is mediated by sialic acid residues [40,41]</td>
</tr>
</tbody>
</table>
References to S5 Table


