結語

本研究では、成体脳神経系前駆細胞と既存神経回路網との機能的関わりについての解析を行った。海馬および大脳皮質において、分裂能を有するネスチン陽性神経系前駆細胞は共に興奮性 GABA 入力を受け取っており、神経回路の活動に伴いダイナミックな応答を示すことが初めて示された。分裂能を持った神経系前駆細胞がシナプス性の入力を受け取っていたことは非常に驚くべき結果である。また、通常成体脳内において抑制性の神経伝達物質であると考えられてきた GABA がこれらの前駆細胞には興奮性に作用することも、非常に興味深い結果である。この興奮性 GABA 入力は、神経系前駆細胞のニューロン分化や神経栄養因子（BDNF）の放出を促す極めて重要な因子であることが結論付けられ、この性質が神経回路網へ可塑性をもたらしていると考えられる。また最近、他の領域においても神経系前駆細胞は分化段階初期において興奮性 GABA 入力を受け取っていることを示す結果が相次いで報告され、神経系前駆細胞の分化や機能発現への興奮性 GABA 入力の関与は共通した現象であると考えられる。また成体脳内における情報伝達システムはニューロン間だけではなく、神経系前駆細胞もまたシナプスを形成し、脳回路の機能に関わっていると考えられ、神経回路の活動に依存した脳の可塑性を理解する上で重要な知見が得られたと言えよう。そして大人になってからでも、脳の活動を高めることで、いつまでも柔軟性に富んだ脳を保つことができるのではないかと期待できる。

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松村直人　博士論文「成体の大脳皮質に存在するネスチン陽性細胞の分化特性に関する研究」(2004)

太田綾　修士論文「成体マウス大脳新皮質における神経系前駆細胞の in vivo での性質に関する研究」(2004)

相澤憲　修士論文「老齢カニクイザルにおける視覚弁別学習の能力減衰」(2006)

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田中裕一　修士論文「成体マウス大脳新皮質に存在するネスチン陽性細胞の性質およびニューロン分化能の解析」(2006)

高田徹夫　修士論文「GABA 刺激は成体大脳皮質 Nestin 陽性細胞からの BDNF 放出を促進する」(2007)

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