子どものこころの発達研究センター
脳機能発達研究部門（松﨑研究室）の活動紹介

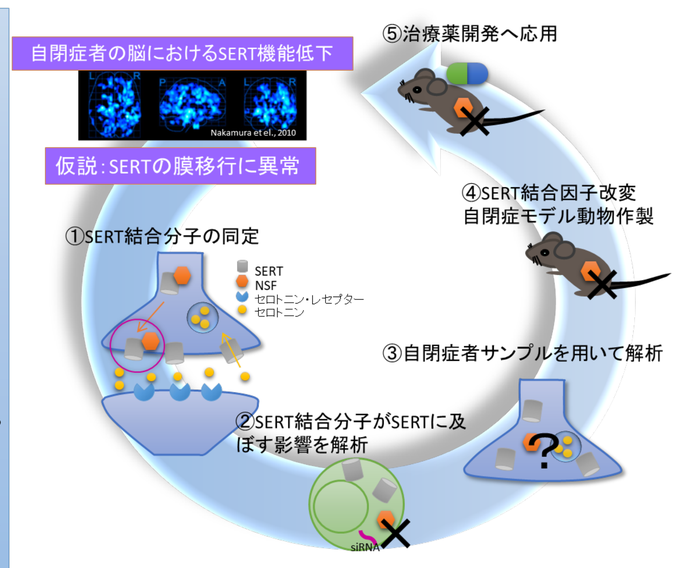
- ◆ 私達は「自閉スペクトラム症（ASD）」の研究をしています。
- ◆ 主に分子生物学を用いた基礎研究を行っていますが、当事者から集めた血液中のバイオマーカー解析や、研究成果を治療に結びつけるための臨床試験も手がけています。
- ◆ 研究室は院生棟の1階にあり、医学部学生が多く出入りしています。

2022 ラボメンバー

ASDとセロトニン

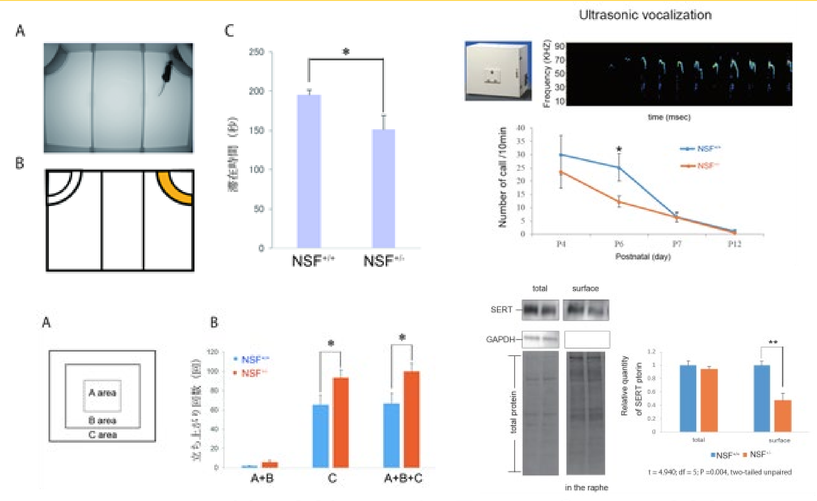
自閉症の「シナプス膜移行異常」仮説の検証

1. 自閉症者では、脳内セロトニントランスポーター（SERT）の機能低下が確認されていた。
2. これまでに自閉症のSERT発現異常の原因と思われる遺伝子NSFを同定した。(*Iwata* et al. *Mol Autism* 2014)
3. 現在、NSFコンディショナルノックアウトマウスの作製に成功している。
4. 今後このマウスが、自閉症者に認められる脳内SERT発現異常や自閉症様行動を示すかどうかを検証していく。



Iwata K, et al. *Mol Autism*, 2014.

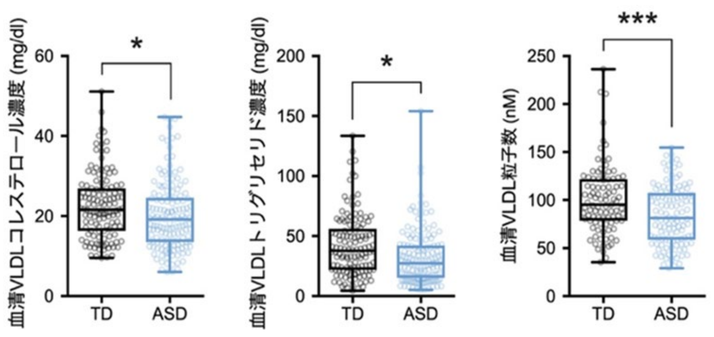
当研究室は、NSF遺伝子のヘテロノックアウトマウスがASD様の行動や脳組織を示すことをつきとめました。



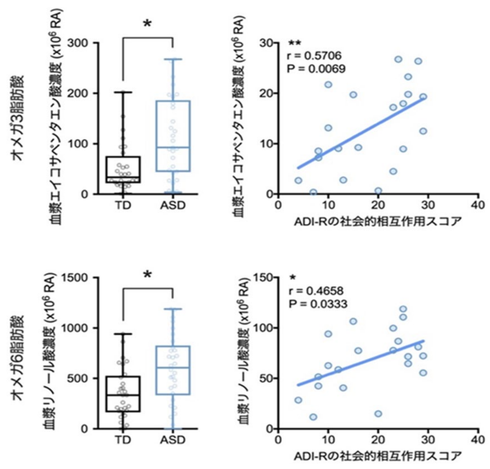
Xie MJ, et al. *Front Genet*, 2021.

ASDの脂質代謝

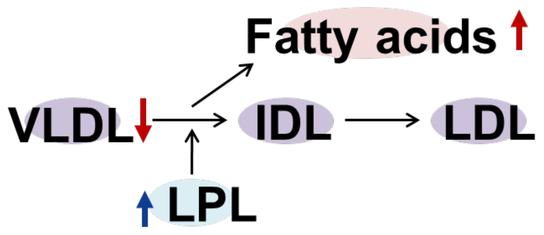
ASD児童は血中VLDL脂質分画が少ない「低脂血症」を合併することを発見しました。



Usui N, et al. *EBioMedicine*, 2020.



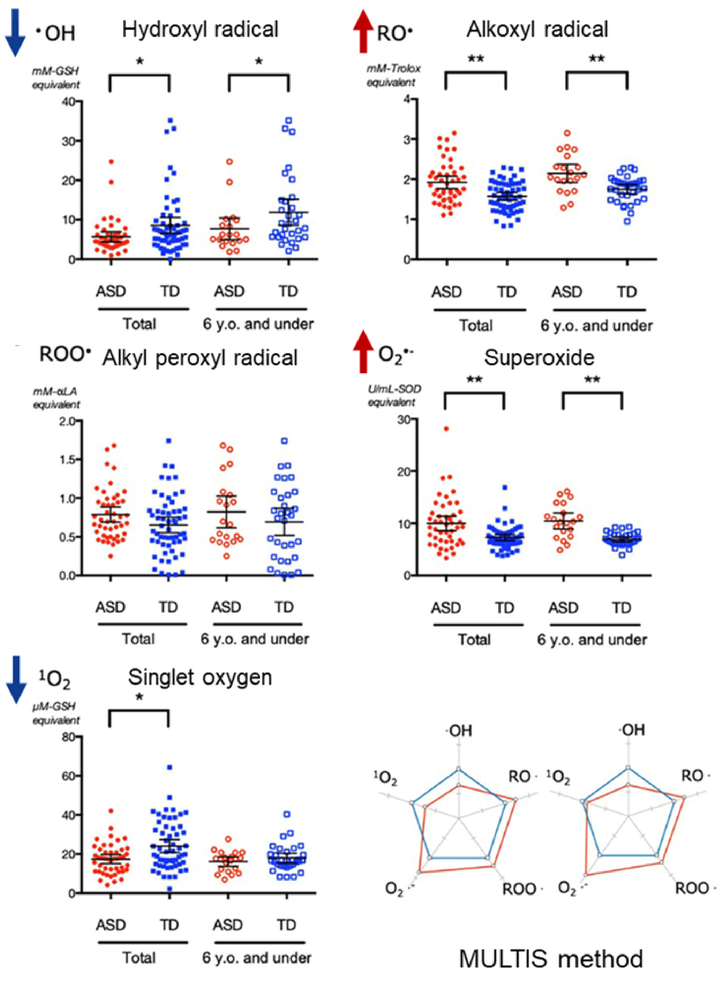
このときLPL活性の上昇、遊離脂肪酸の濃度上昇が認められたので、ASD児童では血中VLDLが分解され低脂血症になると推定されました。



Hirai T, et al. *Res Autism Spectr Disord*, 2020.

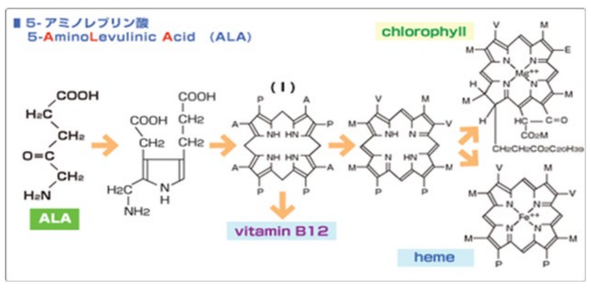
ASDと酸化ストレス

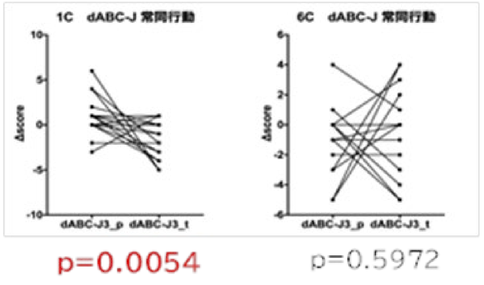
多価不飽和脂肪酸(PUFA)は代謝が進むと活性酸素種(ROS)を介して炎症や酸化ストレスの制御に関わります。
ASD児童は血中のROS活性が特異的なパターンを示すことを発見し、判定技術として特許（特許6830578号）も取得しました。



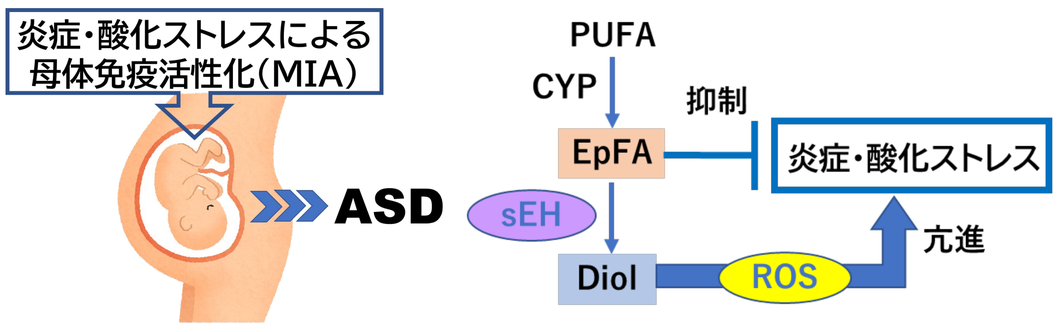
Hirayama A, et al. *Sci Rep*, 2020.

ASDは酸化ストレスやミトコンドリア機能の異常を合併しやすいため、ミトコンドリア機能を高める5-アミノレブリン酸がASDの治療手段にならないかと考えました。5-アミノレブリン酸を18歳以上のASD者に投与する特定臨床研究【jRCTs051190017】を実施して有望な結果を得たため、いま児童対象の特定臨床研究を実施しています。





また、ASDの成因として「妊娠中の母体に生じる急性・慢性の炎症や酸化ストレスが引き起こす母体免疫活性化」にも着目し、臍帯血出生コホートによって、ASDの発症に関わる臍帯血中の脂肪酸代謝物やROSを探索し、特定する試みを開始しています。



詳しい話は研究室で！

松﨑研が貢献した研究論文

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