6-1.
エメリー・ドレイフス型筋ジストロフィー（EDMD）モデルマウスにおける心機能の評価

（大学院修士課程 2 年病態生理学分野）
○松本　滉平
（病態生理学分野）
和田　英治、林　由起子

核膜病は、核膜を構成するタンパク質の遺伝子異常により発症する。様々な核膜病が存在する中で、我々はエメリー・ドレイフス型筋ジストロフィー（EDMD）について研究している。EDMD は、エメリン欠損や A 型ラミンの遺伝子変異により発症することが知られており、骨格筋や心筋が障害される。

我々の先行研究において、骨格筋では A 型ラミン変異マウス（H222P）に比べ、エメリン欠損と H222P を掛け合わせた二重変異マウス（EH）のほうが筋障害が重篤化することから、心筋でも同様に EH マウスのほうが症状が重篤化するのではないかと考えた。

そこで我々は、30 週齢の正常対照マウスと H222P マウス、EH マウスを比較し、心症状の進行に相違があるのかを明らかにすることを目的とし研究を行なった。

まず、心機能を評価するために心エコー検査を行い、LVEF 値（Left Ventricular Ejection Fraction : 左室駆出率）を比較した結果、僅かであるが有意差を持って H222P マウスに比べて EH マウスの LVEF 値が低下していた。また、心重量（心重量／体重）を測定したところ、H222P マウスに比べ EH マウスのほうが有意に増加していた。心筋障害の程度を分子レベルで比較するため、リアルタイム PCR や Western blotting 法を用いて筋線維化マーカーである periostin の発現を比較した結果、H222P マウスと EH マウスの間に有意差は認められなかった。さらに、ミトコンドリアの機能異常が心機能に関与することから、ミトコンドリア関連因子のタンパク質や遺伝子の発現レベルを比較した結果、H222P と EH マウスの間に有意差は認められなかった。

本研究結果より、骨格筋と比較し、心筋では両マウスの症状の差は少なかった。生理学的な機能評価において H222P マウスより EH マウスのほうがわずかに重症化することが示唆されたが、その分子機序を明らかにすることはできなかった。今後、さらに H222P マウスと EH マウスの心筋障害の機序を比較検討していきたい。

6-2.
Individual association of arterial stiffness and pressure wave reflection with increasing ankle-brachial pressure index

（大学院博士課程 2 年東京医科大学　循環器内科）
○高橋　孝通、熊井　健人
（The Department of Cardiology, Tokyo Medical University）
藤井　昌玄、中野　宏乙、松本　知沙、
椎名　一紀、富山　博史、近森大志郎

The longitudinal associations among ankle-brachial pressure index, arterial stiffness, and central hemodynamics

In addition to both pulse wave velocity（PWV; a marker of arterial stiffness）and augmentation index（AI; a marker of central hemodynamics）, not only the decrease of ankle-brachial pressure index（ABI）but also its increase predict the future cardiovascular events. While arterial stiffness and central hemodynamics have been proposed to affect the increase in ABI logically, their effects on increase in ABI have not been fully clarified.　The present cross-sectional and longitudinal studies were conducted to examine the associations of arterial stiffness and central hemodynamics with increase in ABI.　In 4016 men（42±9 years old）, ABI, brachial-ankle PWV（baPWV）and radial AI（rAI）were measured annually for 9 years' observation period.　In the cross-sectional analyses adjusted with age, heart rate and mean blood pressure, both baPWV and rAI were associated with ABI.　As shown in Figure, ABI, baPWV and rAI were annually increased during the follow-up period.　The mixed model linear regression analysis（MMA）conducted in 9 years' annual repeated measurement data demonstrated that increased baPWV（estimate = 0.017, <0.05）and increased rAI（estimate 0.254, <0.05）were significant determinant of annual increase of ABI（<0.01）. In conclusion, the arterial stiffness and central hemodynamics may individually

affect the increase in ABI. Thus, further studies are needed to clarify whether ABI, arterial stiffness, and central hemodynamics individually predicts future cardiovascular events.

6-3.

Longitudinal Association of Arterial Stiffness and Pressure Wave Reflection with Decline of the Cardiac Systolic Performance in Healthy Men

（大学院博士課程 2 年循環器内科学）
○熊井　健人
（東京医科大学病院循環器内科）
冨山　博史、椎名　一紀、高橋　孝通、
中野　宏己、藤井　昌玄、岩崎　陽一、
松本　知沙、山科　　章、近森大志郎
（桐生大学）
山科　　章

【Aims】 This prospective observational study was conducted to examine the individual longitudinal associations of the increases in the arterial stiffness and pressure wave reflection with the decline in the cardiac systolic performance during the study period in healthy middle-aged Japanese men.

【Methods】 In 4016 middle-aged Japanese healthy men (43 ± 9 years), the brachial-ankle pulse wave velocity (baPWV), radial augmentation index (rAI) and pre-ejection period/ejection time (PEP/ET) were measured annually during a 9-year study period.

【Results】 The baPWV, rAI and PEP/ET showed steady annual increases during the study period. According to the results of multivariate linear regression analyses, both the baPWV and rAI measured at the baseline showed significant independent associations with the PEP/ET measured at the baseline (baPWV: $\beta = 0.17$, $p < 0.01$ and rAI: $\beta = 0.11$, $p < 0.01$), whereas neither showed any association with the PEP/ET measured at the end of the study period. The results of the mixed model linear regression analysis of the repeated-measures data collected over the 9-year study period revealed that the baPWV, but not the rAI, showed a significant longitudinal association with the PEP/ET (estimate = 0.69×10^{-4}, $p < 0.01$).

【Conclusion】 In apparently healthy middle-aged Japanese men, the annual increase of the arterial stiffness, rather than the annual increase of the pressure wave reflection, appears to be more closely associated with the annual decline of the cardiac systolic performance as assessed by the systolic time interval.

6-4.

Dispersion of aerosols generated during dental therapy

（社会人大学院博士課程 3 年歯科口腔外科・矯正歯科）
○高鍋　雄亮
（東京医科大学　口腔外科顎分野）
近津　大地

【Background】 The novel coronavirus pandemic has created an urgent need to study the risk of infection from aerosols that are generated during dental care and to conduct a review of infection controls. However, there are almost no reports on the dynamics of aerosols that are produced when high-speed rotating tools are used in dentistry.

【Methods】 In a large cleanroom, laser light and a high-sensitivity camera, along with particle counters, were used to investigate the dynamics of aerosols that are generated when microengines are used.

【Results】 The aerosols tended to be scattered upwards immediately after they were generated and then were gradually dispersed into the surroundings. A few particles that are larger than 5 μm were generated, and nearly all the particles were less than 5 μm in size. There was a wide distribution of the particles over the long term.

【Conclusions】 The possibility that aerosols produced in dental care float far and for a long time in dental clinics before they fall was evaluated. As a result, it was found that patients and dental healthcare professionals are constantly being exposed to aerosols. Although complete prevention of exposure to aerosols that are generated in dental therapy is difficult, our results underscore the importance of ventilation as well as compliance with standard precautions to prevent contact