遺伝子発現の変化を比較し、血清存在下での増殖に関与するさらなる遺伝子の特定を行った。
【結果・考察】 親株において血清添加による発現量の増加が確認された遺伝子 543 個のうち、遺伝子破壊株において発現量の増加が観察されなかった 111 個の遺伝子について、遺伝子破壊株の表現型解析を行い、血清存在下の増殖に関与すると予想される遺伝子を 3 個特定した。特定した 3 遺伝子それぞれの破壊株を用いて、マウス感染実験を行った結果、全ての破壊株感染マウス群において、親株感染マウス群と比べて、顕著な生存率の上昇が確認された。以上より、特定した 3 つの遺伝子が血清存在下での菌糸生育を可能にし、感染宿主における増殖機構に関与することが示唆された。今後、これまでに特定した血清存在下の生育に必須な因子間の相互関係を明らかにし、血清存在下の増殖機構の解明を目指す。

2-6.

Treatment of intra-anal warts with imiquimod 5% cream : a single center prospective open study

（皮膚科学分野）
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【Objectives】 Intra-anal warts are frequently recalcitrant to surgical removal, but imiquimod 5% cream is not formulated to use in medical care practice due to the risk of mucosal inflammation. In the present, single center, prospective, open study, we examined the safety and efficacy of application of imiquimod 5% cream for intra-anal warts.
【Methods】 Imiquimod 5% cream was applied to the entire inner surface of the anal canal with a cotton swab under anoscopy three times weekly for 16 weeks. If complete remission was not achieved, the treatment was continued until week 28. Electrocautery was applied once in a poorly responsive case.
【Results】 21 patients with intra-anal warts, of whom 16 were HIV-positive, were enrolled. Two patients withdrew before week 16, and nine more patients withdrew before week 28. The complete clearance rate was 36.8%（7/19）at week 16, and 70%（7/10）at week 28. Four patients achieved complete clearance at week 16 maintained clearance at week 28 without further treatment. Three out of 4 patients resistant to previous electrocautery achieved clearance with imiquimod 5% cream treatment. Adverse events occurred in 81%（17/21）of the patients mainly at the application site, but serious or previously unencountered adverse events were not observed.
【Conclusion】 Imiquimod 5% cream applied to intra-anal warts was nearly as efficacious and safe as when applied to external anogenital warts. Since treatment modalities for intra-anal warts are very limited, application of imiquimod 5% cream alone with careful and frequent observation or in combination with electrocautery is a useful option for refractory cases of intra-anal wart.

3-①-1.

Preliminary Findings on Control of Dispersion of Aerosols and Droplets During Bronchoscopy Using a newly developed oxygen Mask
（Universal use of closed face oxygen masks for protect against developing COVID-19）

（社会人大学院博士課程 3 年呼吸器・甲状腺外科）
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Background : Considering the global spread of COVID-19 infection, routinely performed aerosol generating procedures such as bronchoscopy have been associated with infection of health-care workers. New strategy for the safe bronchoscopic examination should be created. This is the initial report of a study using computational fluid dynamic simulation to evaluate the newly modified oxygen mask during bronchoscopy.
Methods : The effectiveness of the modified oxygen mask was investigated by visualizing droplets and aerosols. And we quantified and compared droplets and aerosols with and without the newly mask. The airborne droplets counting was performed at two points, 60 cm and 30 cm from the mouth,assuming the distance

between the patient and a bronchoscopist or a caregiver.
Results : The first simulation showed that using the surgical mask, the aerosol leaked from top and bottom of the mask and diffused into air. The newly modified closed mask appeared to prevent droplets from the mouth. Significantly reduced amount of droplet was confirmed leaking between the edge of the mask and the face during the bronchoscopy. Three times coughing produced a similar pattern of generated particles, with peak numbers of airborne droplets as high as 2556 is reached to 60 cm and as low as 2552 is counted in 30 cm. When the same procedure was done during the bronchoscopy through the newly mask over the model's mouth, the flash count remained 39 in 60 cm and 68 in 30 cm.
Conclusion : Our results suggested the use of closed mask protected bronchoscopists and health-care workers from the COVID-19 transmission.

3-①-2.

Effect of photodynamic therapy（PDT）on bleomycin-induced interstitial pneumonia rat models-Does PDT exacerbate interstitial pneumonia?

（社会人大学院博士課程4年呼吸器・甲状腺外科学分野）
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【Objective】 The number of early-stage lung cancer has been increasing owing to recent development in diagnostic imaging technology. However, medically inoperable patients with low lung function or high-risk surgical candidates require effective alternatives to surgery. At present, a clinical trial of photodynamic therapy（PDT）for peripheral small lung cancer is ongoing to develop minimally invasive treatment techniques for such lesions. It is necessary to evaluate the effect of PDT on interstitial pneumonia（IP）when we perform PDT in the peripheral lung field. In this study, we investigated the effect of PDT on bleomycin（BLM）-induced IP rat models.
【Materials and Methods】 BLM was administered intratracheally to 7-week-old rats to prepare IP rat models. Seven days after administration, left thoracotomy was performed under general anesthesia. Talaporfin sodium was intravenously injected, and laser irradiation（150 mW, 100J/cm2）was performed on the left lungs. Seven days after irradiation, whole blood was collected, and plasma was cryopreserved. After euthanizing the rats, the left lungs were resected and fixed with formalin to prepare paraffin sections. Twenty-three rats, including BLM-administered + PDT group（4 rats）, BLM-administered + non-PDT group（10 rats）, normal lung + PDT group（2 rats）, normal lung + non-PDT group（5 rats）, and 2 rats which died immediately after irradiation, were examined. KL-6, SP-D, LDH, and CRP were measured in each plasma sample. Each paraffin sections were pathologically evaluated by staining with HE/EVG, anti-α-SMA antibody, anti-CD68 antibody. Scorings of fibrosis and infiltration of inflammatory cells and the area of collagen fiber were measured.
【Results】 In both the BLM administration group and the normal lung group, there was no significant difference in the value of each marker with and without PDT. Similarly, there was no difference in the score of fibrosis and macrophage infiltration. The percentage of collagen fiber was slightly higher in the PDT group. We considered it the effect of laser irradiation because it was localized just below the pleura in the laser-irradiated area. The reason for the two death immediately after PDT was considered to be acute lung injury caused by technical problems because they had pulmonary edema and severe inflammatory cell infiltration.
【Conclusions】 No acute exacerbation of IP was observed after PDT in this study. In the future, PDT can be a safe treatment option for peripheral small lung cancer with IP.