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Refereed articles:

1. Mikami Y, Grubb BR, Rogers TD, Dang H, Asakura T, Kota P, Gilmore RC, Okuda K, Morton LC, Sun L, Chen G, Wykoff JA, **Ehre C**, Vilar J, van Heusden C, Livraghi-Butrico A, Gentzsch M, Button B, Stutts MJ, Randell SH, O'Neal WK, Boucher RC. Chronic airway epithelial hypoxia exacerbates injury in muco-obstructive lung disease through mucus hyperconcentration. *Sci Transl Med*. 2023 Jun 7;15(699):eabo7728. doi: 10.1126/scitranslmed.abo7728. Epub 2023 Jun 7. PMID: 37285404.
2. **Ehre C**, Hansson GC, Thornton DJ, Ostedgaard LS. Mucus aberrant properties in CF: Insights from cells and animal models. *J Cyst Fibros*. 2022 Sep 15:S1569-1993(22)00656-7. doi: 10.1016/j.jcf.2022.08.019. Epub ahead of print. PMID: 36117114.
3. Okuda K, Shaffer KM, **Ehre C**. Mucins and CFTR: Their Close Relationship. *Int J Mol Sci*. 2022. PMID: 36142171
4. Kato T, Asakura T, Edwards CE, Dang H, Mikami Y, Okuda K, Chen G, Sun L, Gilmore RC, Hawkins P, De la Cruz G, Cooley MR, Bailey AB, Hewitt SM, Chertow DS, Borczuk AC, Salvatore S, Martinez FJ, Thorne LB, Askin FB, **Ehre C**, Randell SH, O'Neal WK, Baric RS, Boucher RC; NIH COVID-19 Autopsy Consortium. Prevalence and Mechanisms of Mucus Accumulation in COVID-19 Lung Disease. *Am J Respir Crit Care Med*. 2022 Jul 11. doi: 10.1164/rccm.202111-2606OC. Epub ahead of print. PMID: 35816430.
5. Hoang ON, Ermund A, Jaramillo AM, Fakhri D, French CB, Flores JR, Karmouty-Quintana H, Magnusson JM, Fois G, Fauler M, Frick M, Braubach P, Hales JB, Kurten RC, Panettieri R, Vergara L, **Ehre C**, Adachi R, Tuvim MJ, Hansson GC, Dickey BF. Mucins MUC5AC and MUC5B Are Variably Packaged in the Same and in Separate Secretory Granules. *Am J Respir Crit Care Med*. 2022 Jul 1. doi: 10.1164/rccm.202202-0309OC. Epub ahead of print. PMID: 35776514.
6. Wykoff JA, Shaffer KM, Araba KC, Markovetz MR, Patarin J, Robert de Saint Vincent M, Donaldson SH, **Ehre C**. Rapid Viscoelastic Characterization of Airway Mucus Using a Benchtop Rheometer. *J Vis Exp*. 2022 Apr 21;(182). doi: 10.3791/63876. PMID: 35532240.
7. Tse LV, Meganck RM, Araba KC, Yount BL, Shaffer KM, Hou YJ, Munt JE, Adams LE, Wykoff JA, Morowitz JM, Dong S, Magness ST, Marzluff WF, Gonzalez LM, **Ehre C**, Baric RS. Genomewide CRISPR knockout screen identified PLAC8 as an essential factor for SARS-CoV-2 infection. *Proc Natl Acad Sci U S A*. 2022 May 3;119(18):e2118126119. doi: 10.1073/pnas.2118126119. Epub 2022 Apr 27. PMID: 35476513; PMCID: PMC9170153.
8. Markovetz MR, Garbarine IC, Morrison CB, Kissner WJ, Seim I, Forest MG, Papanikolas MJ, Freeman R, Ceppe A, Ghio A, Alexis NE, Stick SM, **Ehre C**, Boucher RC, Esther CR, Muhlebach MS, Hill DB. Mucus and mucus flake composition and abundance reflect inflammatory and infection status in cystic fibrosis. *J Cyst Fibros*. 2022 Apr 15:S1569-1993(22)00097-2. doi: 10.1016/j.jcf.2022.04.008. Epub ahead of print. PMID: 35437233.
9. Morrison CB, Edwards CE, Shaffer KM, Araba KC, Wykoff JA, Williams DR, Asakura T, Dang H, Morton LC, Gilmore RC, O'Neal WK, Boucher RC, Baric RS, **Ehre C**. SARS-CoV-2 infection of airway cells causes intense viral and cell shedding, two spreading mechanisms affected by IL-13. *Proc Natl Acad Sci U S A*. 2022 Apr 19;119(16):e2119680119. doi: 10.1073/pnas.2119680119. Epub 2022 Mar 30. PMID: 35353667; PMCID: PMC9169748.
10. Kato T, Radicioni G, Papanikolas MJ, Stoychev GV, Markovetz MR, Aoki K, Porterfield M, Okuda K, Barbosa Cardenas SM, Gilmore RC, Morrison CB, **Ehre C**, Burns KA, White KK, Brennan TA, Goodell HP, Thacker H, Loznev HT, Forsberg LJ, Nagase T, Rubinstein M, Randell SH, Tiemeyer M, Hill DB, Kesimer M, O'Neal WK, Ballard ST, Freeman R, Button B, Boucher RC. Mucus concentration-dependent biophysical abnormalities unify submucosal gland and superficial airway dysfunction in cystic fibrosis. *Sci Adv*. 2022 Apr;8(13):eabm9718. doi: 10.1126/sciadv.abm9718. Epub 2022 Apr 1. PMID: 35363522.

11. Howard RL, Markovetz M, Wang Y, **Ehre C**, Sheikh SZ, Allbritton NL, Hill DB. Biochemical and rheological analysis of human colonic culture mucus reveals similarity to gut mucus. *Biophys J*. 2021 Dec 7;120(23):5384-5394. doi: 10.1016/j.bpj.2021.10.024. Epub 2021 Oct 23. PMID: 34695384; PMCID: PMC8715165.
12. Carpenter J., Yang W., Richa G., Yuanli L., Prashamsha H., Durai B. S., Boris R., Lisa M., C. Ridley, W. K. O'Neal, M. P. Buisine, **C. Ehre**, D. J. Thornton, and M.t Kesimer. Assembly and organization of the N-terminal region of mucin MUC5AC: Indications for structural and functional distinction from MUC5B. *PNAS*. In press.
13. C.B. Morrison, K.M. Shaffer, K.C. Araba, M.R. Markovetz, N.L. Quinney, S. Hao, M.F. Delion, A.L. Flen, L.C. Morton, J. Liao, D.B. Hill, M.L. Drumm, W.K. O'Neal, M. Kesimer, M. Gentsch and **C. Ehre**. Treatment of Cystic Fibrosis Airway Cells with CFTR Modulators Reverses Aberrant Mucus Properties via Hydration. *ERJ*. 2021.
14. T. Toyonaga, K. C. Araba, M. M. Kennedy, B. P. Keith, E. A. Wolber, C. Beasley, E. C. Steinbach, M. S. Schaner, A. Jain, M. D. Long, E. L. Barnes, H. H. Herfarth, K. L. Isaacs, J. J. Hansen, M. Kapadia, J. G. Guillem, M. J. Koruda, R. Rahbar, T. Sadiq, A. S. Gulati, P. Sethupathy, T. S. Furey, **C Ehre**, S. Z. Sheikh. Intestinal Expression of SARS-CoV-2 Entry Molecules ACE2 Associates with Poor Prognosis in Crohn's disease. *Clinical Gastroenterology and Hepatology*. *Sci Rep*. 2021
15. Kato T, Mikami Y, Sun L, Rogers TD, Grubb BR, Morrison CB, **Ehre C**, Sears PR, Ostrowski LE, Randell SH, Boucher RC. Reuse of Cell Culture Inserts for In Vitro Human Primary Airway Epithelial Cell Studies. *Am J Respir Cell Mol Biol*. 2021
16. Y-N H. Escobar, C. B Morrison, Y. Chen, M. E. Rebuli, J. D. Surratt, **C. Ehre**, I. Jaspers. The differential responses to vaped humectants and different forms of nicotine in epithelial cells from smokers and non-smokers. *AJPLung*. 2021.
17. Y. J. Hou, S. Chiba, P. Halfmann, **C. Ehre**, M. Kuroda, K. H Dinno, S. R. Leist, Al. Schäfer, N. Nakajima, K. Takahashi, R. E. Lee, T. M. Mascenik, C. E. Edwards, L. V. Tse, R. C. Boucher, S. H. Randell, T. Suzuki, L. E. Gralinski, Y. Kawaoka and R. S. Baric. SARS-CoV-2 D614G Variant Exhibits Enhanced 1 Replication *ex vivo* and Earlier Transmission *in vivo*. *Science* 2020.
18. **Ehre C.**, Baric. R., Boucher R.C., SARS-CoV-2 infected airway ciliated cells. *NEJM*. Accepted August 2020.
19. H. Danahay, R. Fox, S. Lilley, H. Charlton, K. Adley, L. Christie, E. Ansari, **C. Ehre**, A. Flen, M. Tuvim, B. Dickey, C. Williams, S. Beaudoin, S. P Collingwood, M. Gosling. Potentiating TMEM16A does not stimulate airway mucus secretion or bronchial and pulmonary arterial smooth muscle contraction. *FASEB BioAdvances*. Mar 2020. PMID: 32060135
20. Y. Saini., L. Brandon; I. Choudhary; T. Vo; A. Kidder; C. S. Bathula; **C. Ehre**, N. Wakamatsu-Utsuki; S. Patial. Ablation of IL33 suppresses Th2 responses, but with sustained mucus obstruction, in the Scnn1b transgenic mouse model. *Journal of Immunology*. Accepted 2020.
21. **C. Ehre**. Mucus Accumulation: the Starting Point of Cystic Fibrosis pathogenesis. *Med Sci (Paris)*. Dec 2019. PMID: 31903945
22. Ramsey KA, Chen ACH, Radicioni G, Lourie R, Martin M, Broomfield A, Sheng YH, Hasnain SZ, Radford-Smith G, Simms LA, Burr L, Thornton DJ, Bowler SD, Livengood S, Ceppe A, Knowles MR, Donaldson SH, Hill DB,
23. **Ehre C.** Button B, Alexis NE, Kesimer M, Boucher RC, McGuckin MA. Airway Mucus Hyperconcentration in Non-Cystic Fibrosis Bronchiectasis. *Am J Respir Crit Care Med*. 2019 Nov 25. PMID: 31765597
24. C. Morrison, M. Markovetz, **C. Ehre**. Mucus, Mucins and Cystic Fibrosis. Invited Review Article. *Pediatric Pulmonology*. 2019 Nov. PMID: 31715083

25. Markovetz MR, Subramani DB, Kissner WJ, Morrison CB, Garbarine IC, Ghio A, Ramsey KA, Arora H, Kumar PA, Nix DB, Kumagai T, Krunkosky TM, Krause DC, Radicioni G, Alexis NE, Kesimer M, Tiemeyer M, Boucher RC, **Ehre C.**, Hill DB. Endotracheal Tube Mucus as a Source of Airway Mucus for Rheological Study. *Am J Physiol Lung Cell Mol Physiol*. 2019 Aug 7. PMID: 31389736
26. C.R. Esther Jr.* , M.S. Muhlebach* , **C. Ehre**, D.B. Hill, M.C. Wolfgang, M. Kesimer, K.A. Ramsey, M.R. Markovetz, M.G. Forest, I. Seim, B. Zorn, C.B. Morrison, M.F. Delion, L. Turkovic, S. Ranganathan, S.M. Stick, R.C. Boucher. A Permanent Gel Muco-Inflammatory Milieu Characterizes Early CF Lung Disease. *Sci. Transl. Med.* 2019 Apr. PMID: 30944166 (journal cover from the Ehre lab)
27. **C. Ehre**, Z. L. Rushton, B. Wang, C. Morrison, L. N. Hothem, N. C. Fontana, D. Villalon, W. R. Thelin, C. R. Esther Jr., D. B. Hill, B. R. Grubb, A. Livraghi-Butrico, S. H. Donaldson, R. C. Boucher. Improving Inhaled Mucolytics to Treat Airway Obstructive Diseases. *AJRCCM* 2019 Jan. PMID: 30212240
28. K. Okuda, G. Cheng, R. Gilmore, K. Burns, G.A. Radicioni, M. Kesimer, M. Chua, A. Livraghi-Butrico,
29. **C. Ehre**, C. Doerschuck, S.H. Randell, R.C., Boucher. Localization of Secretory Mucins MUC5AC and MUC5B in Normal Human Airways. *AJRCCM* 2019 Dec. PMID: 30352166
30. Bauer, M. Umer, V. Richardson, A. Cumpian, A. Harder, N. Khosravi, Z. Azzegagh, N. Hara, **C. Ehre**, M. Mohebnasab, M. Caetano, D. Merrick, A. Vanbokhoven, I. Wistuba, H. Kadara, Burton Dickey, K. Velmurugan, P. Mann, X. Lu, A. Baron, C. M. Evans, S. Moghaddam. Requirement for MUC5AC in K-RAS dependent lung carcinogenesis. *JCI Insight*. Aug 2018 PMID: 30089720
31. H. Meng, C. Lockshin, S. Jain, U. Shaligram, J. Martinez, D. Genkin, D. B. Hill, **C. Ehre**, D. Clark, H. Hoppe. Clinical application of polysialylated therapeutic DNase proteins. *Recent Pat Drug Deliv Formul*. Jul 2018 PMID: 30019653
32. **C. Ehre***, K. P. Reighard*, Z. L. Rushton, M. J. R. Ahonen, D. B. Hill, M. H. Schoenfish. Role of nitric oxide-releasing chitosan oligosaccharides on mucus viscoelasticity. (*co-first authors) *ACS Biomaterials Science & Engineering*. Apr 2017 PMID: 30320206
33. K.A. Ramsey, Z.L. Rushton, **C. Ehre**. Mucin Agarose Gel Electrophoresis: Western Blotting for High-Molecular-Weight Glycoproteins. *JoVE*. 2016 Jun 14. PMID: 27341489
34. **C. Ehre***, A.G. Henderson*, B. Button, L.H. Abdullah, L. Cai, M.W. Leigh, G. De Maria, H. Matsui, S. H. Donaldson, C.W. Davis, J.K. Sheehan, R.C. Boucher and M. Kesimer. CF Airway Secretions Exhibit Mucin Hyperconcentration and Increased Osmotic Pressure. (*co-first authors) *J. Clin. Invest.* 2014 Jul 1. PMID: 24892808
35. **Ehre C.**, Ridley C., Thornton D.J. Cystic Fibrosis: an inherited disease affecting mucin-producing organs. *Int J Biochem Cell Biol*. 2014 Jul. PMID: 24685676; PMCID: 24685676
36. **Ehre, C.** [Mucus clearance in the respiratory tract: a new concept?]. 2013. *Med Sci (Paris)*. PMID: 23452599
37. Kesimer, M., **Ehre, C.**, Burns, K.A., Davis, C.W., Sheehan, J.K., and Pickles, R.J. Molecular organization of the mucins and glycocalyx underlying mucus transport over mucosal surfaces of the airways. 2013. *Mucosal Immunol*. PMID: 22929560; PMCID: PMC3637662
38. Martino, M.B., Jones, L., Brighton, B., **Ehre, C.**, Abdulah, L., Davis, C.W., Ron, D., O'Neal, W.K., and Ribeiro, C.M. The ER stress transducer IRE1beta is required for airway epithelial mucin production. 2013. *Mucosal Immunol*. PMID: 23168839
39. **Ehre, C.**, Worthington, E.N., Liesman, R.M., Grubb, B.R., Barbier, D., O'Neal, W.K., Sallenave, J.M., Pickles, R.J., and Boucher, R.C. Overexpressing mouse model demonstrates the protective role of Muc5ac in the lungs. 2012. *Proc Natl Acad Sci U S A*. PMID: 23012413; PMCID: PMC3478656

40. Button, B., Cai, L.H., **Ehre, C.**, Kesimer, M., Hill, D.B., Sheehan, J.K., Boucher, R.C., and Rubinstein, M. A periciliary brush promotes the lung health by separating the mucus layer from airway epithelia. 2012. *Science*. PMID: 22923574; PMCID: PMC3633213
41. Roy, M.G., Rahmani, M., Hernandez, J.R., Alexander, S.N., **Ehre, C.**, Ho, S.B., and Evans, C.M. Mucin Production During Pre- and Post-Natal Mouse Lung Development. 2011. *Am J Respir Cell Mol Biol*. PMID: 21653907; PMCID: PMC3135838
42. Zhu, Y., **Ehre, C.**, Abdullah, L.H., Sheehan, J.K., Roy, M., Evans, C.M., Dickey, B.F., and Davis, C.W. Munc13-2^{-/-} baseline secretion defect reveals source of oligomeric mucins in mouse airways. 2008. *J Physiol* 586:1977-1992. PMID: 18258655; PMCID: PMC 2375724
43. Nguyen, L.P., Omoluabi, O., Parra, S., Frieske, J.M., Clement, C., Ammar-Aouchiche, Z., Ho, S.B., **Ehre, C.**, Kesimer, M., Knoll, B.J., et al. Chronic exposure to beta-blockers attenuates inflammation and mucin content in a murine asthma model. 2008. *Am J Respir Cell Mol Biol*. PMID: 18096872; PMCID: PMC2258446
44. **Ehre, C.**, Zhu, Y., Abdullah, L.H., Olsen, J., Nakayama, K.I., Nakayama, K., Messing, R.O., and Davis, C.W. nPKCepsilon, a P2Y2-R downstream effector in regulated mucin secretion from airway goblet cells. 2007. *Am J Physiol Cell Physiol*. PMID: 17728398;
45. **Ehre, C.**, Rossi, A.H., Abdullah, L.H., De Pestel, K., Hill, S., Olsen, J.C., and Davis, C.W. Barrier role of actin filaments in regulated mucin secretion from airway goblet cells. 2005. *Am J Physiol Cell Physiol*. PMID: 15342343
46. Abdullah, L.H., Bundy, J.T., **Ehre, C.**, and Davis, C.W. Mucin secretion and PKC isoforms in SPOC1 goblet cells: differential activation by purinergic agonist and PMA. 2003. *Am J Physiol Lung Cell Mol Physiol*. PMID: 12588704