time-varying effects was modeled by assuming piecewise hazard risk and piecewise constant hazard ratio. The heterogeneity across studies was expressed by an additive random study effect and a random treatment-by-study interaction. The method was applied to a systematic review of 81 publications reporting on 11,151 AML patients. RESULTS/ANTICIPATED RESULTS: In simulation studies that the proportional hazard assumption is either valid or violated, the proposed method was efficient to achieve comparable performance to IPD meta-analysis, a gold standard approach, in estimating the survival rates, the restricted mean survival time at specific time points and median survival time with the point estimates close to the true values. When HR is not proportional over time, the proposed method was robust in estimating HR and significantly outperformed the classical random-effects meta-analysis. In the application to AML study, the average HR for achieving MRD negativity was 0.36 (95% CrI, 0.33-0.39) for OS and 0.37 (95% CrI, 0.34-0.40) for DFS. The association of MRD negativity with OS and DFS was significant and consistent across all subgroups. DISCUSSION/SIGNIFICANCE OF FINDINGS: The proposed novel method provided a flexible framework for meta-analysis of survival data, to accommodate various types of survival data in one model without assuming proportional hazards assumption. The findings of AML meta-analysis suggest that achievement of MRD negativity is associated with superior DFS and OS in patients with AML.

## *Education/Mentoring/Professional and Career Development*

**62859**

### Bringing Exposures into Mainstream Translational Research: Informatics Opportunities and Methods

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ABSTRACT IMPACT: This work will discuss informatics methods enabling the use of exposure health data in translational research. OBJECTIVES/GOALS: 1. Characterize gaps and formal informatics methods and approaches for enabling use of exposure health in translational research. 2. Education of informatics methods enabling use of exposure health data in translational research. METHODS/STUDY POPULATION: We performed a scoping review of selected literature from PubMed and Scopus. In addition we reviewed literature and documentation of projects using exposure health data in translation research. RESULTS/ANTICIPATED RESULTS: Primary challenges to use of exposure health data in translational research include: (1) Generation of comprehensive spatio-temporal records of exposures, (2) Integration of exposure data with other types of biomedical data, and (3) Uncertainties associated with using data as exact quantifications of exposure which are dependent on both - the proximity of measurement to subject under consideration and the capabilities of measuring devices. We identified 9 major informatics methods that enable incorporation and use of exposure health data in translational research. While there are existing and ongoing efforts in developing informatics methods for ease of incorporating exposure health in translational research, there is a need to further develop formal informatics methods and approaches. DISCUSSION/SIGNIFICANCE OF FINDINGS: Depending on the source about 50 - 75% of our health can be quantified to be a contribution of our environment and lifestyles. In this presentation, we summarize the studies and literature we identified and discuss our key findings and gaps in informatics methods and conclude by discussing how we are covering these topics in an informatics courses.

**70329**

### Automated Lungs Segmentation and Airways Skeletonization from CT Scans in Patients with Cystic Fibrosis

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ABSTRACT IMPACT: Improve healthcare of patients with Cystic Fibrosis by reducing the time needed to generate results. OBJECTIVES/GOALS: We developed an automated framework capable of segmenting the lungs, extract the airways, and create a skeletonize map of the airways from CT scans of Cystic Fibrosis patients. As future expansion, the framework will be expanded to measure the airways diameters, detect the abnormal airways, and count the number of visible airways generations. METHODS/STUDY POPULATION: For this study, 35 CT scans from CF patients with different levels of severity were used to test the developed framework. The lungs segmentation was performed using an algorithm based on Gaussian Mixture Models for mild cases, and for severe cases a technique that uses convex hull and the recurrent addition of 'dots' was implemented. The airways extraction was performed using a 26-points connected components algorithm in conjunction with a curve fitting technique over the histogram of voxel values. Medial axis transform was used to perform the skeletonization of the extracted airways, and airways diameters determined via ray-casting. RESULTS/ANTICIPATED RESULTS: The framework was able to correctly obtain the segmented lungs in all 35 sample volumes regardless of disease severity. In contrast, it tends to fail to skeletonize the airways for severe cases where the framework is unable to differentiate between abnormal lungs conditions and dilated airways. Fine tuning is required to achieve better results. The expected result of the future implemented sections of the framework are focused to characterize the extracted airways by: 1) measuring the airways diameters; 2) detect and count the number of abnormal airways sizes; and 3) count the number of visible airways branching which will permit determination of stage and grade of the lungs of CF patients. DISCUSSION/SIGNIFICANCE OF FINDINGS: The proposed framework allows a fast and reproducible way to segment the lungs and create a skeletonized map of the airways that are independent of clinical training. In addition, this framework will be extended to obtain measurements of airway dilation and branching level, which could provide a deeper insight of the airways in CF patients.

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