

Automatic Gram Staining for Sputum Slide

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Abstract— The Gram stain is the most important and universally used staining technique in the bacteriology laboratory. Gram staining method is used to do staining of the clinical material or the bacteria from colonies on laboratory media and provide a direct visualization of the morphology of the organisms based on their reactions to the chemical present in stains. A sputum sample slide need to be staining before the quality of the sputum sample is determined. However, due to human inconsistency, some of the slides are heavily stain with dark color whereas some of it is lightly stained. This inconsistency would create a difficulty for automated sputum quality system using image processing. Therefore, an automated gram staining for sputum slide is needed in order to standardize the slide staining. The automated Gram-staining will undergo staining, washing, and drying process. Each process periods are controlled by a timer built in the microcontroller. The analysis is done on the accuracy of the position of the slide stain, the consistency of the amounts of staining solution drop on the slide and the time efficiency of this automated system is compared to manual operation.

Index Terms— Gram staining, sputum, automated system