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Livro de resumos

Interactive/automated method to count bacterial colonies

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Abstract

The growth and maintenance of bacteria on agar plates (Petri dishes) has long been a common practice in microbiology. The number of colonies in a culture is usually counted manually to calculate the concentration of bacteria, however, this process is time-consuming, tedious and error prone.

Most automated counting systems, existing on the literature, perform adequately when the colonies are well spaced, large, and circular in shape and with good contrast from the background. When these assumptions are violated, most automated colony analysis systems can rapidly lose reliability, accuracy and utility.

To address the above problems, the goal of this study is to design and implement a cost-effective, software-centred system that accepts general digital camera images as its input, for detecting as well as enumerating bacterial colonies in a fully automatic manner. An interactive semi-automatic system is also proposed to overcome any error from fully automatic system.

The two systems (automated and interactive) combine thresholding, median filter and morphological operations to segment the colonies on a Petri dish image. The next step consists in separating the individual colonies from the clustered colonies. Then, the unit's colonies are counted. To separate and count the clustered colonies, the automatic system uses a watershed transformation and the interactive system uses the clicks of the user.

The proposed systems are capable to reduce the manpower and time required for counting colonies while producing correct colony counting.

Keywords: Colony Counter, Colony Forming Unit, Colony Segmentation, Interactive Methods, Petri Dish.