

First of all it is necessary to be able to quickly diagnose the physiological state of the activated sludge to lead the system to optimal conditions. To optimize the operation have been developed atlases diagnosis of the condition the activated sludge. These atlases can be used for rapid analysis. Atlases can determine categorize active sludges. Depending on the load on the organic active sludge, observed following its main modifications: overloaded sludge, moderately loaded sludge, sludge with low load, starving sludge. Knowledge category of activated sludge can quickly restore the system by addition enzymes and do not interrupt the cleaning process.

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### Activated algae granulation: A biological solution for efficient microalgae harvesting



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A novel biological method was developed as an alternative solution for the major drawback in developing the microalgae biotechnology for wastewater treatment at industrial scale: the microalgae harvesting step. The method allows efficient and fast harvesting of target microalgae cells (such as *Chlorella* sp.) and consists in the granulation of the photoautotrophic microalgae – bacteria biomass, in a stirred tank photo-bioreactor with specific operational conditions, using real wastewater as growth medium. Granulation process requires the presence of the filamentous microalgae which represent the base matrix of the biological structure. During the development of the granular entities, termed as *activated algae granules*, target microalgae cells are efficiently entrapped in the granular structure, thus almost complete microalgae biomass recovery (99.15–99.99%) is ensured by granules settling only. Moreover, high density of the biomass within the granule's structure (with 80–300 µg dry weight/granule) and large granules' size (500–3000 µm) ensure a high settling velocity of the granules (18–29 m/h) which is higher with about  $3\text{--}5 \times 10^3$  times than that of individual *Chlorella* sp. cells. Such performances prove the viability of the granular activated algae system by sustaining a cost saving microalgae harvesting strategy for the development of a new generation biotechnology for wastewater treatment.

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### Antibodies prepared against plant virus proteins expressed in *Escherichia coli*



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Preparation of antibodies to plant viruses by expressing virus coat protein (CP) gene in bacteria has been facilitated by the advent of recombinant DNA technology. Virus purification, a crucial step in conventional antibody preparation, is not required. Virus purification might be a lengthy procedure and provide varying and occasionally unsatisfactory results concerning specificity and titer of the prepared antiserum because the virus purity is variable. Besides, equipment such as high speed and ultra-

centrifuges may be unavailable in laboratories particularly in under-developed countries. But, recombinant DNA technology has tackled these problems and facilitated preparation of antibodies against viral gene products such as CP. Expression of foreign genes in *Escherichia coli* is relatively simple, fast and inexpensive for producing high quantities of proteins which undergo minimal post-translational modifications. In addition, the fusion of tags to target genes facilitates their expression and improves their solubility, stability, and purification. Proteins from several plant viruses have been produced in *E. coli* and successfully used for raising virus-specific antibodies for immunodiagnosis. This is especially useful for viruses which occur at lower concentrations in plants such as fruit tree viruses. Serological tests particularly enzyme-linked immune sorbent assay (ELISA) is commonly for screening a large number of samples. The antibody, the main requirement of ELISA, is purified from antiserum which is raised against virus protein expressed in bacteria. In this presentation, the use of viral proteins, expressed in *E. coli*, as the antigen to produce virus-specific antibodies is elaborated and methods for optimization of such antibodies are discussed.

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### Researches regarding the influence of packaging on the quality of some dairy products



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The purpose of this paper is to identify changes that may occur in contact with aluminium plastic packaging and some dairy products. The limit amount of substances that can migrate from food in packaged products is determined by using the migration tests. The studies were based on the migration of packaging components into dairy products which have been used for such packaging. We analysed the following packaging: white PET bottles, white polystyrene packaging, packaging polypropylene and aluminium caps PS printed with UV ink. Another objective of the research is the hygienic status checking for dairy products packaging. Also, analyses were performed for the determination of heavy metals in the final product. The migration tests were performed in specialized laboratories in the country and abroad during 2014. The packaging studies were tested for migration of toxic compounds with 3% acetic acid and 50% ethanol for 10 days at 40 °C. The measurements have shown that packaged products did not exceeded the limits allowed by the regulations applicable to migration. In terms of the heavy metal content, total of the contents of 4 analysed metals (lead, cadmium, chromium, mercury) was less than 100 ppm, and the microbiological point of view, the packaging corresponding to the number of microorganisms is less than the maximum allowable number of microorganisms. The studied packaging does not influence negatively the quality of dairy products.

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