Bacterial intracellular energy storage

Which lipid is a major energy storage compound in bacteria?
In general,polyP,PHA,and glycogenare widely distributed across bacterial species as energy storage compounds. The other two neutral lipids investigated in this study are comparatively minor energy reserves in bacteria and mainly found in the super phylum Proteobacteria and phylum Actinobacteria.

How are energy reserves incorporated and lost in bacteria?
Distribution patterns of key enzymesand their combined pathways in bacteria provided a comprehensive view of how energy reserves are incorporated and lost. In general,polyP,PHA,and glycogen are widely distributed across bacterial species as energy storage compounds.

How do you calculate stored energy in a bacterial cell?
Both ? and S can be time-dependent and will depend on the bacterial species. Stored energy --The stored energy in the cell is given by E stored = g V,where V is the cell volume and g is the energy stored per unit volume of the biomass.

What are the five major energy reserves in bacteria?
So far, five major energy reserves have been identified in bacteria due to their capacity to support bacterial persistence under nutrient deprivation conditions. These include polyphosphate (polyP), glycogen, wax ester (WE), triacylglycerol (TAG), and polyhydroxyalkanoates (PHAs).

Does intracellular ATP concentration regulate bacterial cell fate?
These findings highlight the crucial role of intracellular ATP concentration in the regulation of bacterial cell fateand provide new insights into the formation of VBNC and persister cells.

How does bacterial catabolism contribute to cellular energy production?
Bacterial catabolism of these substrates fuels cellular energy production through the generation of reducing electron donorslike NADH and FADH 2 and ATP. Furthermore,catabolic processes serve as a critical source of essential biosynthetic precursors for anabolic pathways.

In bacteria, the main energy-storage products are probably the following: (1) Intracellular polysaccharide, probably mainly homoglycans, e.g. glycogen. (2) Poly-?-hydroxybutyrate ...

Critical determinants of denitrification performance include the efficiency of carbon sources storage during the anaerobic phase, the extent of carbon oxidation in the aerobic phase, and ...

Intracellular accumulation of amino acids seems to be a novel storage strategy for polyphosphate-accumulating bacteria under dynamic anaerobic-aerobic feast-famine conditions.

Bacterial intracellular energy storage

Some intracellular bacteria use their T3SS or T4SS to hijack host cellular metabolic pathway for carbon and energy acquisition (Table 1, Fig. 1). Bacterial secretion ...

Through this analysis, a clearer picture about the metabolism of energy reserves in bacteria is presented, which could serve as a guide for further theoretical and experimental ...

Selective carbon sources influence the microbial community, metabolic pathways, and intracellular carbon storage preference of purple phototrophic bacteria culture

Background: Adenosine triphosphate (ATP) is used as an intracellular energy source by all living organisms. It plays a central role in the respiration and metabolism, and is ...

Independent analyses of the 375 distribution patterns of the five energy reserves in bacteria found a consistent and statistically 376 significant correlation between energy reserve loss and ...

Bacterial infections disrupt the metabolism of host cells to obtain carbon sources and energy for intracellular survival. Ongoing in-depth studies of bacterial secretion systems ...

In oral bacteria, the main energy-storage products are: (1) intracellular polysaccharide (IPS), stored into the cell, and (2) soluble extracellular polysaccharide (EPS), ...

Such compounds likely serve as intracellular C-storage pools that sustain the activities of microorganisms growing on stoichiometrically imbalanced substrates, making them ...

Bacteria store glycogen as a crucial intracellular reserve of glucose and energy, enabling them to survive nutrient scarcity, adapt to environmental changes, and persist in host ...

Once a pathogen gains entrance to the intracellular space, it can manipulate host cholesterol trafficking pathways to access nutrient-rich vesicles or acquire membrane ...

In this regard, intracellular glycogen accumulation has been associated with important physiological functions in several bacterial species, including gut commensals. However, the ...

Intracellular storage of carbon (C) and energy, as well as other nutrients, has long been documented among fungi and bacteria and is currently a subject of research for industrial ...

Polyhydroxyalkanoates (PHAs) are biopolymeric intracellular inclusions that serve as carbon and energy storage compounds for diversified microorganisms. PHAs are ...

Intracellular storage of carbon and phosphorus can facilitate efficient energy acquisition for cell metabolism and growth in anoxic environments. The intracellular storage ...

Bacterial intracellular energy storage

The concept of biomass growth is central to microbial carbon (C) cycling and ecosystem nutrient turnover. Microbial biomass is usually assumed to grow by cellular ...

In this article, we consider three aspects of metabolism in the host-pathogen interaction: first, how bacteria within a host employ specific modules of central ...

Intracellular storage evidently plays a quantitatively significant role in microbial assimilation of C under a broad range of stoichiometric conditions, and ...

The intracellular C storage standard using the NLFA/PLFA ratio established from this study can be applied for searching soil management practices for vitalizing soil C ...

Also, the Carbohydrate Catabolite Repression (CCR) system, which allows bacteria to regulate which carbohydrates to use for energy catabolism by sensing intracellular nutrient content, also ...

A diverse range of soil microorganisms accumulate energy to secure their future needs under resource fluctuation or deficiency. Microbial intracellular storage can substantially mediate the ...

Lipid droplets (LDs) are intracellular organelles specialized for the storage of energy in the form of neutral lipids such as triglycerides and sterol esters. They are ubiquitous organelles, present in ...

Abstract Previous bioinformatics studies have linked gain or loss of energy reserves with host-pathogen interactions and bacterial virulence based on a comparatively ...