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Laundry

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Enzymes

What IS an Enzyme?

Enzymes are simply proteins that can speed up chemical reactions by breaking down complex stains into simpler substances that can be washed away by detergents. Modern laundry detergent derives most of their enzymes from two sources:

- Bacteria: *Bacillus subtilis*, *Bacillus licheniformis*, *Bacillus amyloliquefaciens*
- Fungi: *Aspergillus niger*, *Trichoderma reesei*, *Humicola insolens*

These enzymes are carefully cultivated in labs.

What Enzymes are probably in my detergent?

- [Proteases \(subtilisin, alcalase\)](#): These enzymes target protein-based stains such as blood, sweat, dairy, egg, and meat. Proteases break down protein molecules into smaller peptides and amino acids, making them easier to wash away.
- [Lipases](#): These enzymes work on fat- and oil-based stains such as grease, butter, and salad dressing. Lipases catalyze the breakdown of fats into glycerin and free fatty acids, which are easily rinsed away.
- [Amylases](#): These enzymes break down carbohydrate-based stains, such as those from pasta, potatoes, and sauces. Amylases convert starch into smaller sugar molecules that dissolve more easily in water.
- [Cellulases](#): These enzymes target microfibers in cotton fabrics, helping to remove soil and prevent fabric pilling, resulting in brighter, softer garments.
- [Mannanases](#): Effective against food stains such as ice cream, sauces and dairy products, mannanases break down polysaccharides such as guar gum, which is commonly found in processed foods.
- [Pectinases](#): These enzymes help remove fruit and jam stains by breaking down pectin, a complex carbohydrate found in plant cell walls.
- [Scientific Reports: Removal of eDNA from fabrics Dnase](#)

But how do they work?

Enzymes when put in water, will attach themselves to what they're attracted to, your stains! They will then begin to break them down into smaller water soluble pieces. The smaller pieces can then be

lifted and removed by the water, agitation, and surfactants in the laundry detergent.

Benefits of Enzymes in laundry vs just detergent

- Much better on stains
- Lower washing temps are usable, detergent alone needs hotter temps
- Gentler on fabrics
- Biodegradable: These are already enzymes that naturally occur. We're not adding any antibiotics or as many harmful chemicals to the water
- Reduce the need for more detergent

Possible issues with enzymes

- Enzymes are reactive in water meaning, liquid detergent does not have enzymes, you must use powder or an enzyme additive
- Some people have reactions to enzymes, any one with skin sensitivity should be careful by testing on one garment first.
- Storage: Enzymes are sensitive to extreme temp changes and humidity. Meaning they should be stored in a cool dark place with an air tight lid.

Enzyme Resources & Additional Info

- [Enzyme Fact Sheet](#) Link to American Cleaning Institute on Enzymes
- [Wikipedia on Enzymes in detergent](#)
- [Creative Enzymes](#)

Pretreatment

Identify the Issue

How you pretreat will depend on the issue so it makes sense we need to identify the problem. If you know exactly what caused the stain, this makes things easier. If you do not, try to investigate. Is it greasy? Is it dirt based? Could it be blood? Is it pet stains or pet/animal urine?

Urine

- Use a pet based enzyme cleaner for any type of urine (bonus this works in bathrooms too!)
- 2 brands I've used and had good success with, Natures Miracle and Eco Strong
- Follow the directions, generally these need to sit for awhile
- Rinse, repeat if necessary

Urine smell will NOT go away without an enzyme cleaner formulated for urine. The ammonia scent needs to be broken down by the enzymes and not just covered with perfume.

Resources

- [Lipase List - Pretreaters \(North America\)](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit

Detergent

- [Lipase List - Detergents \(North America\)](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit

Boosters

- [Lipase List - Boosters \(North America\)](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit

Reddit Sources:

- [Lipase List](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit
- [Laundry 101 with u/KismaiAesthetics](#) — [non-Reddit Link](#)
- [Sunscreen stains- what cause them, how to prevent & remove them](#) by [u/Fair-Shift-1962](#) — [Non-Reddit Link](#) (images are missing)
- [Laundry Spa Day by u/KismaiAesthetics](#) — Author has specifically requested no reposting of this post so there is no non-reddit link.
- [When The Rinse Washes You Clean, You'll Know --- Citric Acid Rinses by u/KismaiAesthetics](#) — [Non-Reddit Link](#)
- [Polyquat Spots by u/KismaiAesthetics](#) — [Non-Reddit Link](#)
- [Scrud - The Dirtiest Word in Laundry by u/KismaiAesthetics](#) — [Non-Reddit Link](#)

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