

TL;DR SCIENCE BREAKDOWN

(AKA: Why your hair and scalp act the way they do, without the textbook.)

- **Dry scalp** is dehydrated skin; dandruff is a yeast imbalance — treat them differently.
- **Hard water** glues minerals to your hair, causing instant dullness and buildup.
- Healthy hair + scalp want a **pH** around 4.5–5.5 — too alkaline equals frizz and irritation.
- **Sebum** is good; overwashing confuses your scalp into making more oil.
- **Curly/coarse hair** feels drier because sebum can't travel down spirals.
- **Buildup** isn't just product — minerals, oils, microbes, and stylers all pile up differently.
- **Clarifying** resets everything when your hair stops behaving.
- Your scalp has a **microbiome** — balance it or expect flakes, itch, and chaos.
- Scorching **hot showers** = irritated scalp and dehydrated hair.
- **Sleeping with wet hair** is a microbial horror story, don't do it.
- **Heavy oils** on the scalp cause more problems than they solve.
- If your hair suddenly feels waxy, flat, or confused — it's probably **water quality or buildup**.



HAIR + SCALP SCIENCE DEEP DIVE

The Nerdy Bits Textbook
Version (AKA: Why Your
Hair or Scalp Is Acting Up)

Scalp Health 101

Your scalp is just face skin with attitude. Treat it accordingly.

Do:

- Massage your scalp gently with finger tips.
 - Use a scalp brush gently (not like you're grating parmesan)
 - Keep nails off the scalp
- Clarify regularly
- Use lukewarm water—your scalp hates boiling showers as much as your moisturizer does.

Don't:

- Sleep with wet hair (microbial horror movie vibes)
- Cak on oil treatments that never fully wash out
- Skip washing for 8–12 days “because curls” — your scalp disagrees.

Watch For:

- Flakes (sign of dryness (small white flakes), dandruff (larger, oily flakes), or a skin condition)
- Hard-to-remove residue
- Itchiness
- Sudden oiliness
- These usually mean: ingredient sensitivity, seasonal dryness, naughty ingredients, water quality issues. Clarify + simplify your routine for a week. (More info on this later).

Dry Scalp ≠ Dandruff (Yes, They're Different)

- Dry Scalp:
 - Skin is dehydrated.
 - Flakes are small, white, and dust-like.
 - Happens from over washing, hot water, or harsh products, sensitivities/allergies.
 - Can have itchiness.
- Dandruff:
 - Caused by an overgrowth of *Malassezia*, a yeast that loves oil.
 - Flakes are larger, oily, and often yellowish.
 - Usually paired with itchiness and scalp irritation.
- Translation:
 - Dry scalp needs hydration + gentle care.
 - Dandruff needs clarifying + targeted ingredients for anti-dandruff and oil control.
 - *You cannot moisturize away dandruff, and you cannot anti-dandruff-shampoo your way out of dehydration.*

Water Quality Matters (Yes, Your Shower Might Be Sabotaging You)

- Hard water = high mineral content (calcium, magnesium, etc).
- These minerals:
 - Stick to your hair shaft
 - Prevent products from working.
 - Make hair feel dry, dull, sticky, or tangled
 - Can irritate the scalp or cause buildup
- If your hair suddenly feels “meh”:
 - A shower filter can absolutely help.
 - A treatment to remove minerals could be necessary.

Bonus:

- Minerals + sulfates = buildup faster
- Minerals + heavy conditioners = gunky hair
- Minerals + oils = a hard-pass greasy mess

The pH Problem (AKA: Why Balancing Matters)

- Hair + scalp like to live around pH 4.5–5.5 — slightly acidic.
- If your products blast them into alkaline territory:
 - Cuticle lifts
 - Frizz increases
 - Color fades faster
 - Scalp gets irritated
- Good news:
 - Most professional shampoos/conditioners are already pH-balanced.
 - DIY hacks (baking soda washes, vinegar rinses, etc.) are often the culprits of chaos.

Sebum: Your Built-In Conditioner

Sebum is the scalp's natural oil—actually GOOD for your hair.

- Sebum:
 - Lubricates the scalp
 - Reduces breakage
 - Adds shine
 - Calms irritation
- Why some people get greasy:
 - Hormones
 - Stress
 - Harsh shampoos stripping too much
 - Over-washing causing rebound oil production
- Why curly hair gets dry:
 - Sebum can't travel down spirals easily
 - Meaning moisture needs to be added manually (sorry).

The Microbiome (Your Scalp's Ecosystem)

- Your scalp has its own microbiome (bacteria + yeast).
- It thrives on balance.
- When it's off:
 - Itchiness
 - Flaking
 - Sudden oiliness
 - Weird patches
- Causes of imbalance:
 - Overwashing
 - Not washing enough
 - Using too many heavy oils
 - Very hot showers
 - Basically: treat your scalp like part of your face, not a separate creature.

Buildup Isn't Just Product

There are four kinds of buildup:

1. Mineral buildup (from hard water)
2. Product buildup (silicones, waxes, heavy butters)
3. Oil buildup (your own scalp oil)
4. Microbial buildup ("I haven't washed in 8 days" buildup)

Each one needs a different solution, which is why one shampoo won't fix every issue.

