If there is no other importance of melanin other than protection from the sun then why are researchers trying to use melanin as a material for bioelectronic devices?

quora.com/If-there-is-no-other-importance-of-melanin-other-than-protection-from-the-sun-then-why-are-researchers-trying-to-use-melanin-as-a-material-for-bioelectronic-devices

Melanin is a conductor of electricity and energy.
Scientific Proof that Melanin is Electric
Organic electronics is a branch of electronics that deals with conductive molecules.

It is called 'organic' electronics because the molecules are carbon-based, like the molecules of living things. This is as opposed to traditional electronics (or metal electronics) which relies on inorganic conductors such as copper or silicon.

Electrically conductive polymers are mostly derivatives of polyacetylene black (the "simplest melanin"). Melanin is a pigment being found in most organisms. Technically all melanins are derivatives of polyacetylene.

In humans, melanin is the primary determinant of skin color. It is also found in hair, the pigmented tissue underlying the iris of the eye, and the stria vascularis of the inner ear. In the brain, tissues with melanin include the medulla and zona reticularis of the adrenal gland, and pigment-bearing neurons within areas of the brain-stem, such as the locus coeruleus and the substantia nigra.

A 1972 paper in the journal Science proposed a model for electronic conduction in the melanins. [Ginness JE (1972). "Mobility gaps: a mechanism for band gaps in melanins". Science 177 (52): 896–7. doi:10.1126/science.177.4052.896. PMID 5054646.]

Physical properties and technological applications of Melanin

Structurally and electronically, melanins are "rigid-backbone" conductive polymers composed of polyacetylene, polypyrrole, and polyaniline "Blacks" and their mixed copolymers. The simplest melanin is polyacetylene, and some fungal melanins are pure polyacetylene.

In 1963, D.E Weiss and coworkers reported high electrical conductivity in a melanin, iodine-doped and oxidized polypyrrole "Black". They achieved the quite high conductivity of 1 Ohm/cm. A decade later, John McGinness, and coworkers reported a high conductivity "ON" state in a voltage-controlled solid-state threshold switch made with DOPA melanin. Further, this material emitted a flash of light—electroluminescence—when it switched. Melanin also shows negative resistance, a classic property of electronically-active conductive polymers. Likewise, melanin is the best sound-absorbing material known, because of its strong electron-phonon coupling. This may be related to melanin's presence in the inner ear.

These early discoveries were "lost" until the recent emergence of such melanins in device applications, particularly electroluminescent displays. In 2000, the Nobel Prize in Chemistry was awarded to three scientists for their subsequent 1977 (re)discovery and development of such conductive organic polymers. In an essential reprise of the work by Weiss et al., these polymers were oxidized, iodine-doped "polyacetylene black" melanins. There is no evidence the Nobel committee was aware of the almost identical prior report by Weiss et al. of passive high conductivity in iodinated polypyrrole black or of switching and high electrical conductivity in DOPA melanin and related organic semiconductors. The melanin organic electronic device is now in the Smithsonian Institution's National Museum of American History's "Smithsonian Chips" , collection of historic solid-state electronic devices.