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Giant wood spider
Richard Seaman

[How to Make Artificial Spider Silk](#)

It's on the silk dope

Spider silk is extremely flexible, yet it is one of the strongest materials found in nature: at the same thickness, it is stronger than the steel. That's why researchers have been trying for so long to imitate it. Now an Oxford University team shows that if you intend to spin silk like a spider, then you should know there is something on the artificial silk that does not work. The team found a new way of determining the potential of the raw material (silk "dope") for making fibers with the same amazing traits of natural silks spun by spiders and silkworms. They discovered that the artificial starting materials currently employed, which are mixes of dissolved silk fibers, do not display the same flow qualities as natural silk dope, delivering lower quality fibers than the super-strong filaments. The team made of Chris Holland and Professor Fritz Vollrath, together with Dr Ann Terry and Dr David Porter, from the Oxford Silk Group, compared unspun natural silk dope and artificial silk dope under the same forces as those found in a spider's spinning duct. The natural and artificial dopes behaved completely different. Natural silk dope taken directly from the gland can be spun into strong fibers without chemicals needed, the way the old fisherman drew the glands of silkworms to spin 'silk cast' fishing line. But the spinning of the artificial dope, achieved by dissolving silk fibers, require chemical treatments and even so, the strength of these fibers does not compare with that of the natural silk. It appears that natural silk dopes have the inner ability to shape into a fiber, a quality lost in when artificial silk dope is processed. Decoding the mechanisms of this process will lead to artificial silk closer to the quality of the animal's own silk. "To mimic the way in which animals spin silk we believe it will be necessary first to match the flow properties of reconstituted and native silk feedstocks. This could ultimately lead to landing one of Nature's greatest catches - high performance fibres, naturally produced." said Vollrath.