

Modern gladiators - New body armour promises to transform fighting sports

1 Looking somewhat like a stormtrooper from “Star Wars”, Martin “The Wolf” Söderström, a Swedish devotee of
2 kung fu, raps a heavy fighting stick down onto the arm of his opponent, who is clad in **similar** attire. At the
3 other side of the room a computer quickly **determines** if the blow would have **caused** a **bruise** or a fracture if
4 his adversary had not been so well **protected**. Welcome to a new world of violent martial arts brought to you by
5 **advances** in materials and microelectronics.

6 In an **ordinary** match, Mr Söderström would not be able to fight like this. His punches would have to be pulled
7 to **avoid** causing serious or even fatal **injuries**. Chunky body protectors and helmets offer fighters more defense
8 from harm, but such gear also slows and restricts their **movements**. Nor does it make scoring any easier. Would
9 whacking that stick over his opponent’s head, **for instance**, have broken his skull, or delivered but a glancing
10 blow?

11 The armoured body suit which Mr Söderström and his opponent are wearing is called the Lorica. It has been
12 **developed** by Chiron Global, an Australian firm. At just 19 kilos, it is neither too heavy nor cumbersome to
13 **prevent** even aerial cartwheels, but it is **tough** enough to render painless a powerful sword strike to the head or
14 the chest, says Mr Söderström. That protection comes from Kevlar, a tough synthetic material **invented** almost
15 50 years ago by DuPont and now extensively employed in **protective** clothing. In a Lorica, however, it is
16 reinforced with carbon-fibre composites, a lightweight material that is stronger than steel and **widely** used in
17 aerospace. On top of that are various polymers and other materials, which Chiron is keeping secret.

18 Some of the areas around the body’s **joints** are protected only by a **dense** foam without a rigid shell. This allows
19 **mobility** for moves like kicks, but it also means that strikes to certain areas of the body are **banned** and that the
20 edges of weapons must be blunted. The company says its helmet can **protect** against the concussive injuries that
21 now worry many in contact sports, but that remains to be seen. It can get hot inside the suits, so fighters use
22 a Lorica for 90-second bouts and then rest while they are cooled by compressed air blasted into a network of
23 silicone tubes **contained** in the suit. The air passes out through thousands of tiny holes held against the skin by
24 an undergarment.

25 Scoring is done by 52 sensors, which 10,000 times a second **measure various forces**, including blows,
26 accelerations and vibrations, **generated** by the **impact** of hands, feet and weapons. The data are wirelessly
27 transmitted to a computer to calculate the fractures, **tissue damage** and other injuries which are **likely** to have
28 been sustained had the fighters been unprotected. Because there is little published information on **wounds**
29 inflicted by blows from certain edged weapons on different body parts, Chiron’s researchers plan to **carry out**
30 their own experiments, attacking pig cadavers with weapons **such as** flails, arrows, and ninja stars.

31 Less than 24 hours after the first video of the test fight **appeared** online, an official at America’s Special
32 Operations Command phoned Chiron to ask about **obtaining** some suits. Four more armies have since made
33 similar **requests**. The army, it **seems**, thinks the suits can be used to teach close-quarter combat. The bright
34 lights of television may beckon, but this somewhat brutal Aussie invention seems already to have found another
35 market.