COMMENTARY

Application of on-dose identification and blockchain to prevent drug counterfeiting

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Drug manufacturing is expensive, and it takes approximately two billion dollars to manufacture a single type of drug. Replacement of these drugs with counterfeit drugs is a prevailing problem and causes about 150 billion-dollar [1] loss to the pharmaceutical industry annually. In addition to loss of money, counterfeit drugs also pose a threat to lives, and sabotages reputed brand names. The counterfeit drug problem is encouraged because of lack of coordination and traceability of the drug itself within the pharmaceutical supply chain. The pharmaceutical supply chain is a highly complex and branched chain where many players are involved in moving the drug from one point to the other. Since there is no system in place to accurately trace the drug movement, counterfeiters enter the supply chain, and replace the authentic drugs with fake ones.

To counter the problem of counterfeit drugs the FDA came up with the drug security chain act in 2013 which outlines the need for an interoperable and electronic system for supply chain management by 2023 [2]. Moreover, current measures involve printing of non-human readable barcodes, RFID tags, and QR codes onto packaging, but these approaches do not prevent drug counterfeiters from replacing the drug inside the packaging with a fake one. Therefore, there is a need for a solution which could be used to verify the authenticity of the drug and its brand using on-dose identification for the tablets and capsules themselves, not on the packaging.

This inspired me to launch a startup called Oggic to prevent the entry of counterfeit drugs into the supply chain. Oggic is proposing that micro QR codes be printed directly onto the drugs using tablet printing machines, which have been in existence for more

than 60 years and are based on the principle of inkjet printing or rubber rolls [3]. The messages contained within these micro QR codes can be cryptographically signed by the manufacturer and can be verified by anyone including patients by scanning the codes with their smartphones. These micro codes generated by Oggic's software to be printed onto drugs will be dynamic and will be different for each batch of drug manufacturing. Furthermore, each drug transaction i.e. the movement of a drug between players will be recorded on the blockchain making it tamper proof, decentralised, timestamped, and highly secure. Since each supplier would need to scan and sign the message as the drug moves through the supply chain, it would be a lot easier to trace where the counterfeiting happened. The traceability of the drug in real time while it is being shipped using micro QR codes printed onto drugs could help prevent drug counterfeiting in the future.

Disclosure statement

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