

# Comparative study of the citotoxicity of drills steel and coated with TiAlN for dental implantology



The quality system of JDentalCare Srl is certified with respect to EN ISO 13485. The dental implants and the surgical instruments of IIA class are certified by TUV Product Service CE 0123

## Aim

The JDentalCare's drills have an exclusive coating TiAlN.

The correct preparation of the implant site is essential for the primary healing that allows the osseointegration. The drill osteotomy causes not only a mechanical trauma but also a temperature increase of the bone that must repair around the implant.

For this reason JDentalCare proposes a new coating for the drills to increase the hardness and the wear resistance. Moreover, the coating gives to the drill a black colour which facilitates recognition of the depth marks by the dentist during the implant osteotomy.

The cytotoxicity of the coating TiAlN compared with that of the standard steel drills was studied.

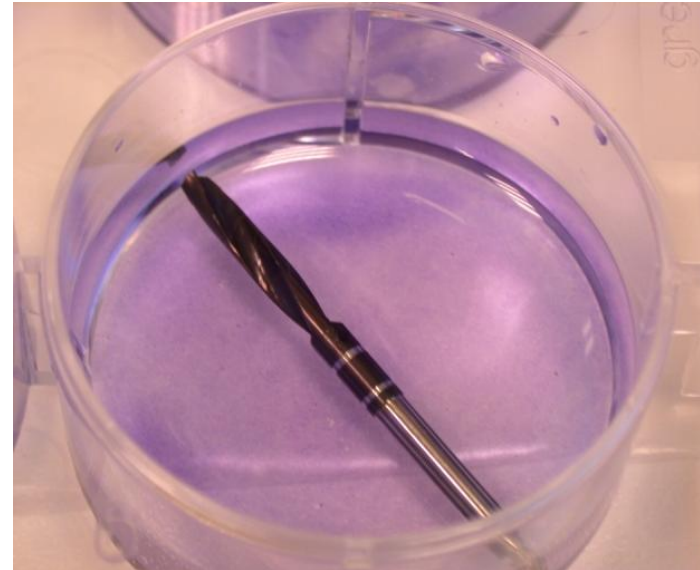


## Methods

Citotoxicity tests were conducted by direct contact with fibroblasts and steel drills or drills coated. At the end of the 72h incubation period the cells stained with toluidine blue were observed by light microscopy.



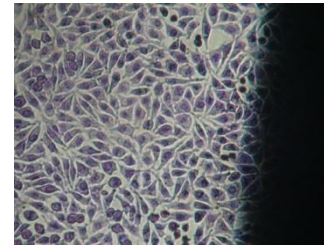
Macroscopic image of a drill steel uncoated placed in the container with cells after staining with toluidine blue.



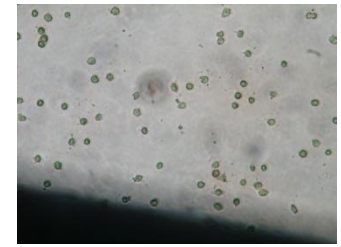
Macroscopic image of a drill steel coated with Ti AlN placed in the container with cells after staining with toluidine blue.

## Results

No cytotoxic effects of the coating on fibroblasts were found. No inflammatory cells were observed.

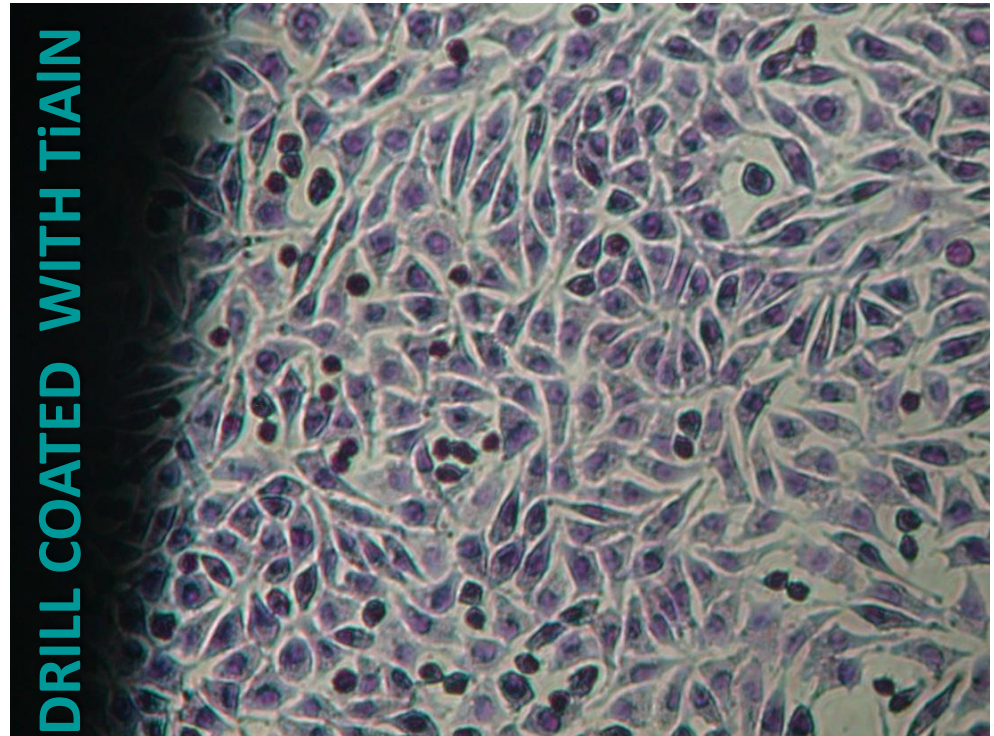
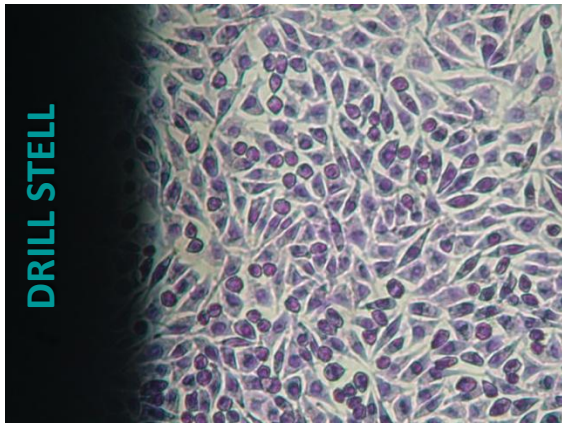


Negative control  
(gold cylinder)



Positive control  
(gutta-percha cylinder)

The fibroblasts were not disturbed by the release of cytotoxic factors. Phenomena of detachment of the coating were not observed.





## Conclusions

**The TiAlN coating of the JDentalCare's drills represents an innovative solution. This coating is highly biocompatible, increases the hardness of the drill and reduces the wear and oxidation, gives to the drill a black colour which facilitates recognition of the depth marks by the dentist during the implant osteotomy.**