

**Microbiome modulation of implant-related infection by a novel miniaturized pulsed
electromagnetic field device**

Table 1 - Means and standard deviations of electrical parameters (polarization resistance – $R_{p_{tot}}$ and capacitance - Q_{tot}) obtained from the equivalent circuit models of control and pulse groups.

Groups	$R_{p_{out}}$ ($M\Omega \cdot cm^2$)	$R_{p_{in}}$ ($M\Omega \cdot cm^2$)	R_{tot} ($M\Omega \cdot cm^2$)	Q_{out} (S^*s^a) $\times 10^{-6}$	Q_{in} (S^*s^a) $\times 10^{-6}$	Q_{tot} (S^*s^a) $\times 10^{-6}$	η_1	η_2	W_{diff} ($S^*s^{(1/2)}$) $\times 10^{-6}$	$X^2 \times 10^{-3}$
Control	36.43 (± 44.14)	19.91 (± 19.49)	56.34 (± 63.63) ^a	1267.09 (± 2044.17)	8.36 (± 5.92)	1275.45 (± 2050.09) ^a	0.77 (± 0.09)	0.86 (± 0.16)	5.24 (± 0.10)	8.45 (± 7.60)
Pulse	1.64 (± 2.21)	14.69 (± 11.36)	16.34 (± 13.57) ^a	7374.28 (± 137.1)	7.04 (± 7.95)	7381.32 (± 142.71) ^a	0.83 (± 0.09)	0.63 (± 0.21)	1.38 (± 1.26)	3.21 (± 4.33)

Different letters indicate statistically significant differences among the groups ($p < 0.05$). R_p = polarization resistance, Q = capacitance. n and $X^2 \times 10^{-3}$ obtained from EIS (goodness-of-fit on the order of 10^{-3}).

Table 2 - Mean and standard deviation (in parenthesis) values of electrochemical parameters (E_{corr} , i_{corr} , β_a , $-\beta_c$, i_{pass} , and corrosion rate) obtained from the control and pulse groups.

Groups	E_{corr} (mV) vs. SCE	i_{corr} (nA·cm ⁻²)	β_a (V/dec ⁻¹)	$-\beta_c$ (V/dec ⁻¹)	I_{pass} (nA·cm ⁻²)
Control	-238.62 (±162.70) ^a	12.88 (±10.71) ^a	1.07 (±1.08)	0.56 (±0.18)	84.26 (±45.68) ^a
Pulse	-288.16 (±162.28) ^a	28.34 (±25.96) ^a	2.64 (±2.68)	0.72 (±0.36)	50.22 (±20.96) ^a

Different letters indicate statistically significant differences among the groups ($p < 0.05$)

Figure 1 - Pulsed electromagnetic field (PEMF) evaluated in terms of in vitro polymicrobial biofilm formation (24h). Microbiological composition of in vitro biofilms was evaluated by checkerboard DNA–DNA hybridization technique, to assess the presence and levels of 40 bacterial species associated to dental implant-related infections. (A) Levels ($\times 10^5$) of 40 bacterial species evaluated for both groups, pulse (activated PEMF) and control (non-activated).

