

**Figure S1.** Comparison of FTIR spectra of raw Monocryl and Monocryl Plus threads over the full range of wave numbers (500-3500cm<sup>-1</sup>).

# Description of abbreviations and symbols contained in tables S1-S3.

## Simulated FTIR Spectra:

**Band spectrum:**  $\nu$  - vibration frequency expressed in wave numbers ( $\text{cm}^{-1}$ ) scaled with a scaling factor (0.976);  $I_R$  - Relative intensity of the bands,

## Experimental FTIR Spectra:

$\nu$  - wavenumber ( $\text{cm}^{-1}$ ),  $I_R$  - Relative intensity of the bands

**Key of vibration assignment:** s – symmetrical, as – asymmetric,  $\nu$  – stretching,  $\gamma$  – out of plane bending vibration: wagging and twisting,  $\beta$  &  $\delta$  – in-plane bending: scissoring and rocking vibration, vs – very strong, s – strong, m – medium, w – weak, vw – very weak, sh – shoulder, am – amorphous phase, cr – crystalline phase, ls - long sequence.

**Table S1.** Theoretical and experimental frequencies, relative intensity and approximate band assignments for Monocryl and Monocryl Plus.

EXP				SYM		ASSIGNMENTS
MONOCRYL		MONOCRYL plus				
$\nu$ ( $\text{cm}^{-1}$ )	$I_R$ (a.u.)	$\nu$ ( $\text{cm}^{-1}$ )	$I_R$ (a.u.)	$\nu$ ( $\text{cm}^{-1}$ )	$I_R$ (a.u.)	
515	w	515	w	513	w	$\gamma$ C=O, out of plane def.
537	w	540	w	545	w	$\beta$ C=O, in plane def.
564	w	560	w	582	w	
				602		
590	m	594	m	636	vvw	$\delta$ CCC def. + $\beta$ COO def.
628	w, cr	630	w, cr	660		
				729	vvw	
720	w, br, am	720	w, br, am	755		$\delta$ CH <sub>2</sub> rocking
807	w, cr	811	w, cr	805	w	$\nu_s$ COC + $\delta_{as}^-$ CH <sub>3</sub> (rocking)
850	w, am	850	w, am	822	w	
884	w, sh, am	885	w, sh, am	918	w	
902	w, cr	900	w, cr			$\delta_{as}^-$ CH <sub>3</sub> (rocking)
955	w	955	w	950	w	$\nu_{as}$ O-C-C in $\epsilon$ -Caprolactone seg- ment
975	w, cr	974	w, cr	970	w	
1087	vs, ls	1085	s, ls	1083	vs	$\nu_{as}$ O-C-C in Glycolide seg.
				1163	vs	
				1180	m, sh	
1150	vs	1150	vs	1195	m, sh	$\nu_{as}$ C-C(O)-O
	am + cr		am + cr	1219	w	+ $\gamma_s$ CH <sub>2</sub> (wagging)

1385	m, sh, am	1389	m, sh, am	1390	m	$\delta_{as}^+$ CH <sub>3</sub> (umbrella) + $\gamma$ CH (wag- ging)
1417	s, cr	1419	s, cr	1435	m	
1540		1542		1532	vw	$\beta_s$ CH <sub>2</sub> (scisoring)
1580	vw	1580	vw	1560	vw	
1742	vs cr + am	1742	vs cr + am	1744	vw	$\nu$ C=O
2850		2850		--	vw	$\nu_s$ CH <sub>2</sub>
2870	w	2870	w	2870		$\nu_{as}$ CH <sub>2</sub>
2916		2920		2933		$\nu_s$ CH <sub>3</sub>
2957	w	2957	w	2946	vw	$\nu_{as}$ CH <sub>3</sub>

**Table S2.** Theoretical and experimental frequencies, relative intensity and approximate band assignments for Vicryl and Vicryl Plus.

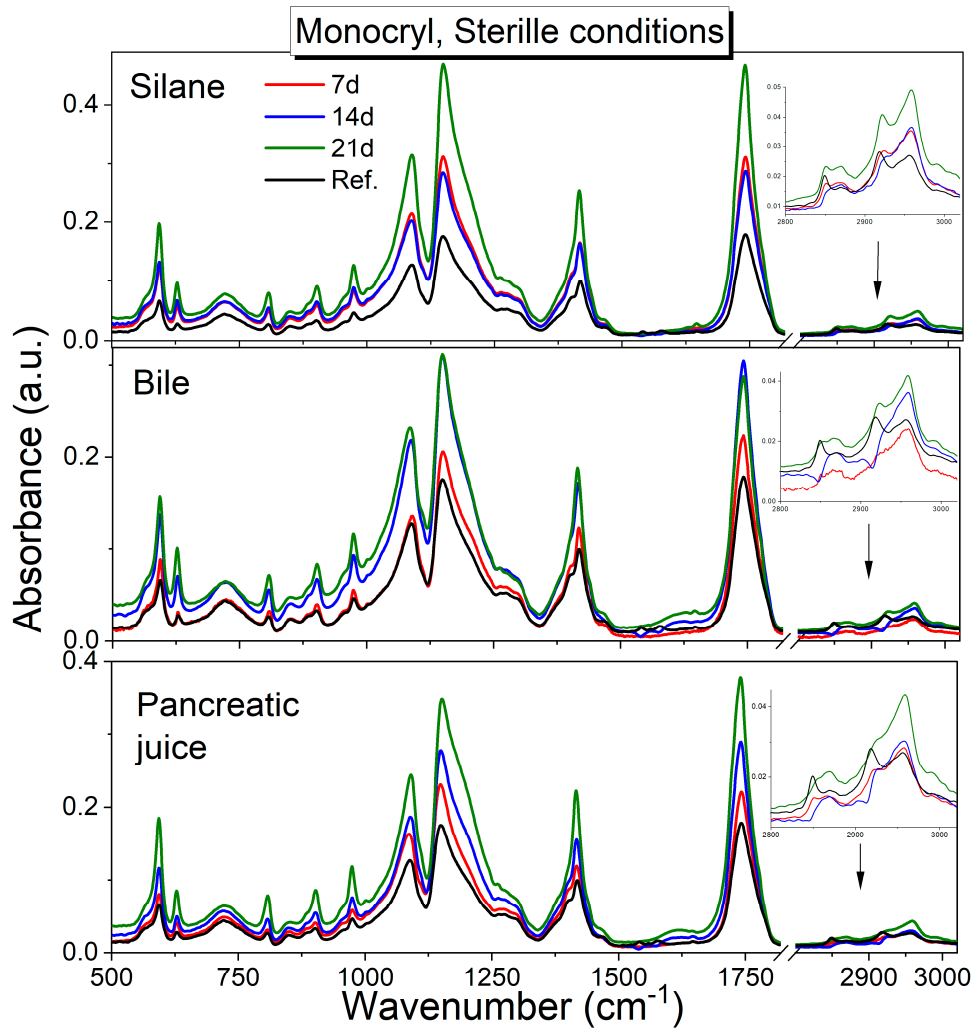
EXP				SYM		ASSIGNMENTS
VICRYL		VICRYL plus				
$\nu$ (cm <sup>-1</sup> )	I <sub>R</sub> (a.u.)	$\nu$ (cm <sup>-1</sup> )	I <sub>R</sub> (a.u.)	$\nu$ (cm <sup>-1</sup> )	I <sub>R</sub> (a.u.)	
535	m, sh	535	m	540		$\gamma$ C=O
563	m	594	m	565	vvw	
665	w	667	w	670	vvw	$\beta$ C=O + vCCC skeletal
684	w	680	w			
760	w, am	762	w, am	756	vvw	$\delta$ CH <sub>2</sub> (rocking) + $\beta$ C=O
808	w, cr	810	w, cr	812	w	
850	w, am	850	w, am	840		$\nu_s$ COC + $\delta_{as}^-$ CH <sub>3</sub> (rocking)
900	w, cr	905	w, cr	866 900	w, sh w	
975	m, cr	974	m, cr	980	m	$\delta_{as}^-$ CH <sub>3</sub> (rocking)
						vCCC skeletal + $\nu_{as}$ O-C(CH <sub>3</sub> ) in L-Lactide segment
1047	m, sh	1047	m, sh	1028 1052	vw	$\nu_{as}$ O-C(CH <sub>3</sub> ) in L-Lactide segment + vCCC skeletal
1090	vs, ls	1088	s, ls	1095	vs	
1133	s, sh, am	1132	s, sh, am			$\nu_{as}$ O-C-C in Glycolide seg.
1161	vs, cr	1161	vs, cr	1157	vs	
1183	w, sh, cr	--	--			$\nu_{as}$ C-C(O)-O in L-Lactide segment
1270	w, sh	1270	w, sh	1276	vw	
1398	m, sh, am	1398	w, sh, am	1406	w, sh	$\nu_{as}$ C-C(O)-O in Glycolide seg.
1420	m, cr	1420	m, cr	1417	m	
1720	s, sh	1720	m, sh	1745	vw	$\gamma_{as}$ CH <sub>2</sub> (twisting)
1745	vs	1742	s			
2849	w	2850	w	2852		$\delta_{as}^+$ CH <sub>3</sub> (umbrella)
--	--	--	--	2868	vw	
						$\nu$ C=O,
						$\nu_s$ CH <sub>2</sub>
						$\nu_{as}$ CH <sub>2</sub>

2917	w	2917	w	2910	vw	$\nu_s\text{CH}_3$
2959	w	2960	w	2973		$\nu_{as}\text{CH}_3$

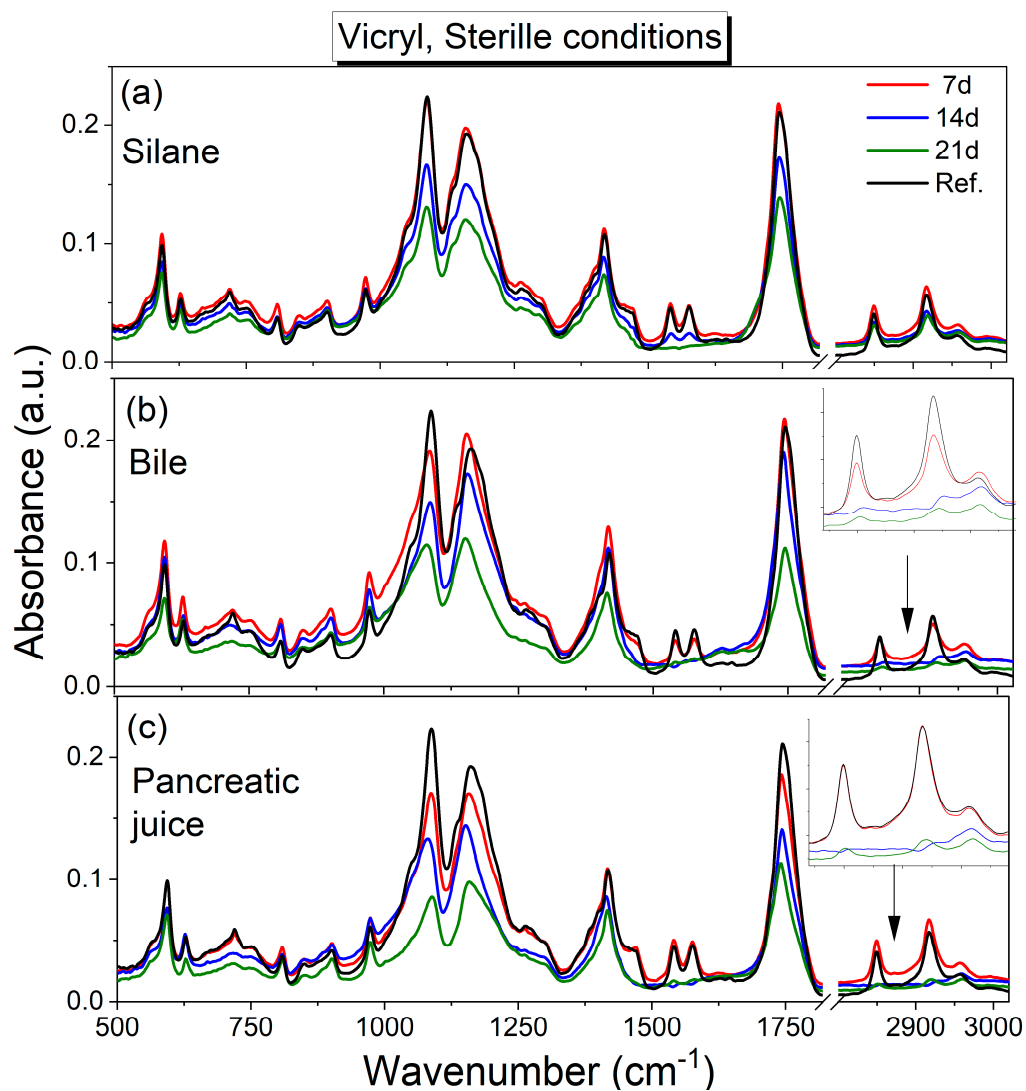
**Table S3.** Theoretical and experimental frequencies, relative intensity and approximate band assignments for PDS and PDS Plus.

EXP				SYM		ASSIGNMENTS
PDS		PDS plus				
$\nu$ (cm <sup>-1</sup> )	I <sub>R</sub> (a.u.)	$\nu$ (cm <sup>-1</sup> )	I <sub>R</sub> (a.u.)	$\nu$ (cm-1)	I <sub>R</sub> (a.u.)	
550	w, sh	557	w	545	w	$\delta$ CCC def
582	w	579	w	570	w	$\gamma$ C=O, out of plane def.
703	m, sh	703	m, sh	714	w	$\beta$ C=O, in plane def. (COO) + $\nu$ CCC
723	m, am	723	m, am	737	vw	$\delta$ CH <sub>2</sub> rocking
844	m, am	846, am	m	846	w	$\delta_{as}^-$ CH <sub>3</sub> (rocking)
872	m, am	873, am	m	877	w	$\nu_s$ COC
928	m, cr	930	m, cr	922	w	$\nu_{as}$ C-O-C
1002	m, sh	1000	m, sh	1020	w	nCCC (skeletal)
1050	s, am	1050	s, am	--	--	$\nu_{as}$ C-O-C
1070	s, ls	1070	s, ls	--	--	$\nu_{as}$ O-C-C in Glycolide seg.
1108	s, sh	1110	s, sh	1093	s, sh	
1126	vs, am + cr	1125	s, sh am + cr	1130	s	$\nu_{as}$ C-C(O)-O (in ester)
1202	s, cr	1201	vs, cr	1160	s, sh	
1237	m, sh	1235	m	1205	w, sh	$\nu_{as}$ C-C(O)-O (ethyl acetate)+ $\gamma_s$ CH <sub>2</sub>
1270		1267		1285		$\gamma_s$ CH <sub>2</sub>
1290	m	1290	m	1300	w	$\gamma_{as}$ CH <sub>2</sub>
1378	w, am	1365	w, am	1350		$\delta_{as}^+$ CH <sub>3</sub> (umbrella) + $\gamma_s$ CH <sub>2</sub>
				1360	vw	
1420	m, cr	1420	m, cr	1390	w, sh	
1430	m, am	1430	m, am	1405	m	$\gamma_{as}$ CH <sub>2</sub>
				1435		
1455	w, am	1455	w, am	1450	w	$\beta_s$ CH <sub>2</sub> (scisoring)
				1475		
1734	vs, am	1733	vs, am	1740	s	$\nu$ C=O
1746	vs, sh, am + cr	1745	vs, sh, am + cr			
2851		2850		2873		$\nu_s$ CH <sub>2</sub>
2882	vw	2881	vw	295	m	$\nu_{as}$ CH <sub>2</sub>
2922	vw	2918	vw	2960	m	$\nu$ CH

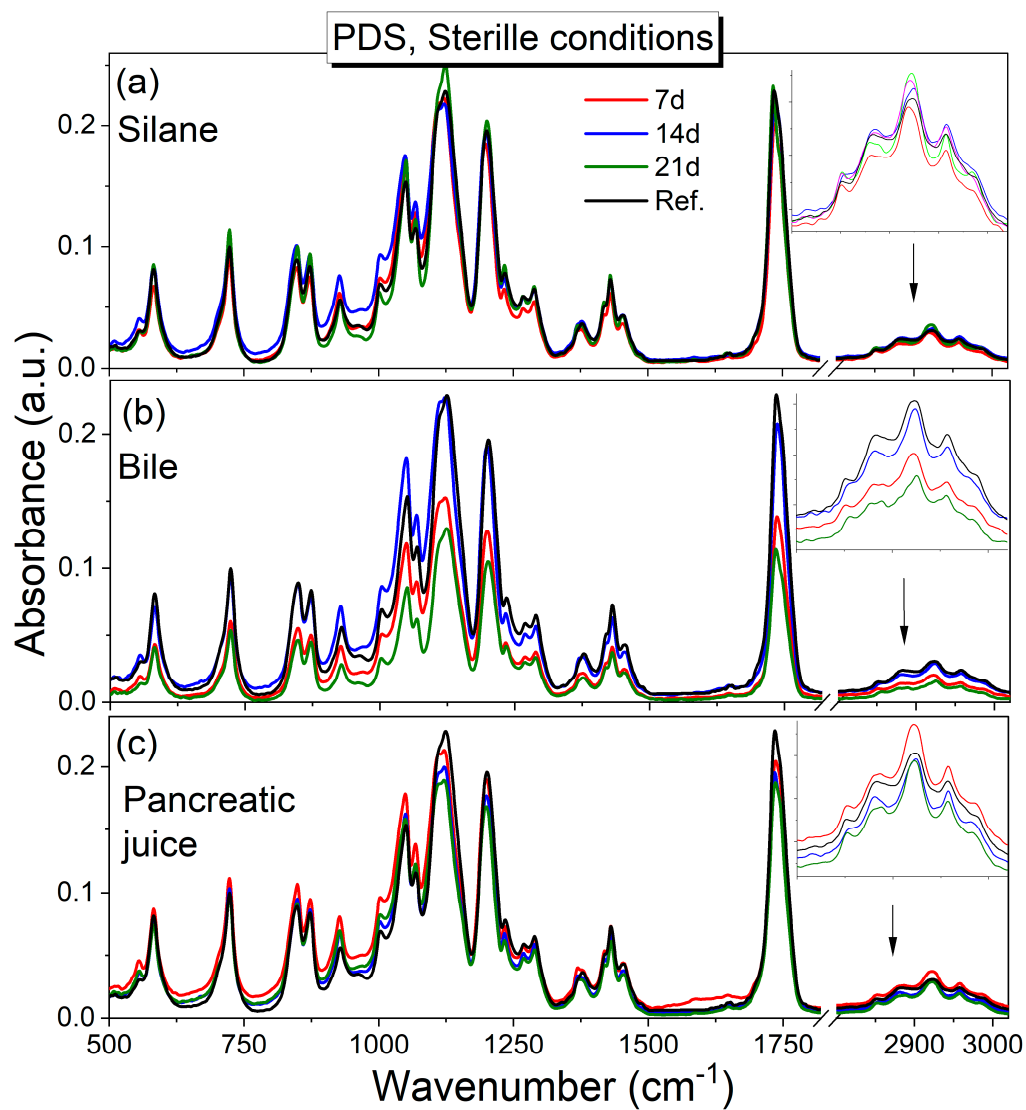
2958		2925		2990		$\nu_s\text{CH}_3$
2989	vw	2957	vw	3020	m	$\nu_{as}\text{CH}_3$
		2988				



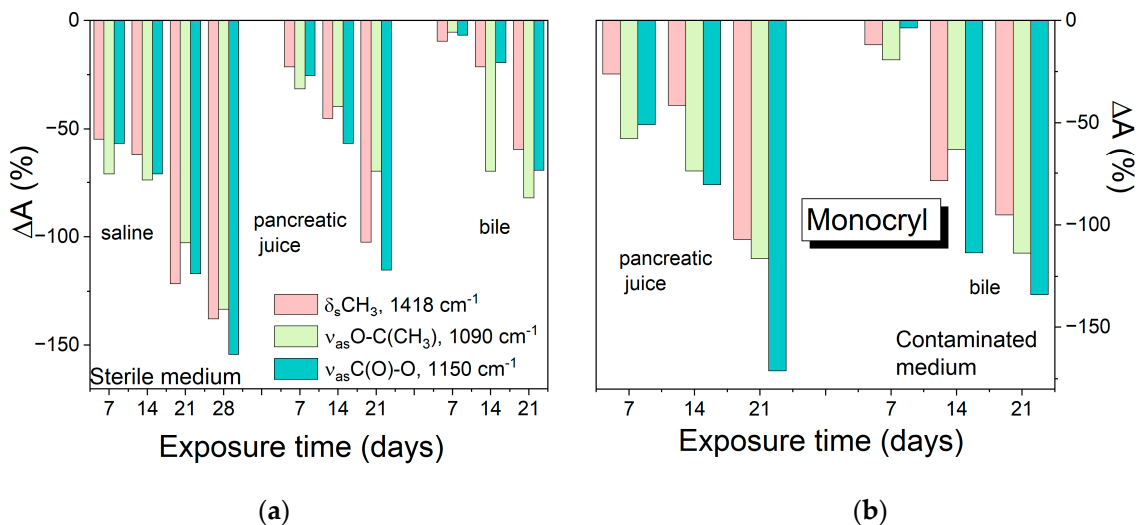
**Figure S2.** FTIR spectra in the 500-3500  $\text{cm}^{-1}$  range for the Monocryl surgical suture immersed in sterile environment in various body fluids for 7, 14 and 21 days. (a) saline , (b) bile, (c) pancreatic juice.



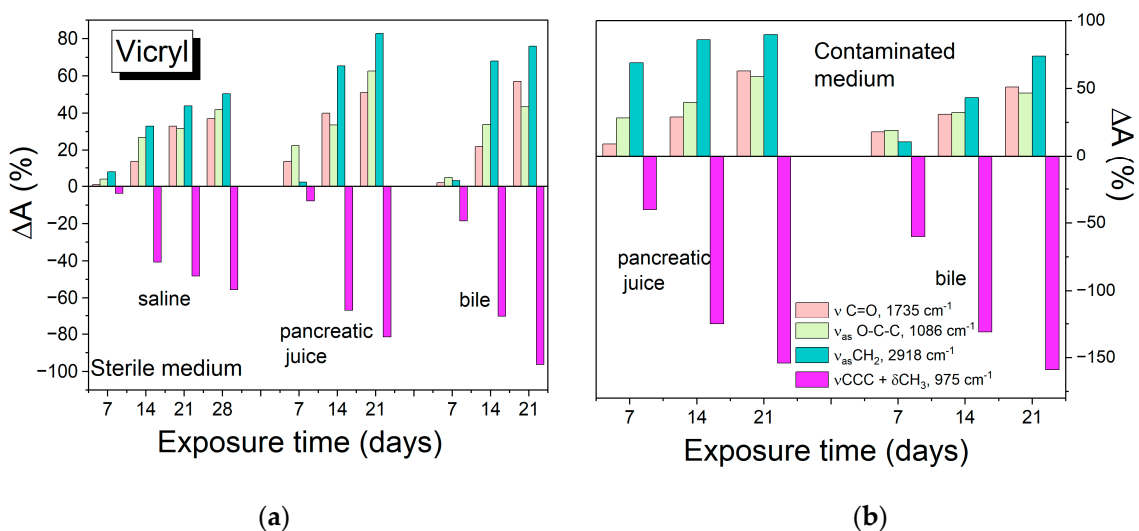
**Figure S3.** FTIR spectra in the 500-3500 cm<sup>-1</sup> range for the Vicryl surgical suture immersed in sterile environment in various body fluids for 7, 14 and 21 days. (a) saline , (b) bile, (c) pancreatic juice.



**Figure S4.** FTIR spectra in the 500-3500 cm<sup>-1</sup> range for the PDS surgical suture immersed in sterile environment in various body fluids for 7, 14 and 21 days. (a) saline , (b) bile, (c) pancreatic juice.

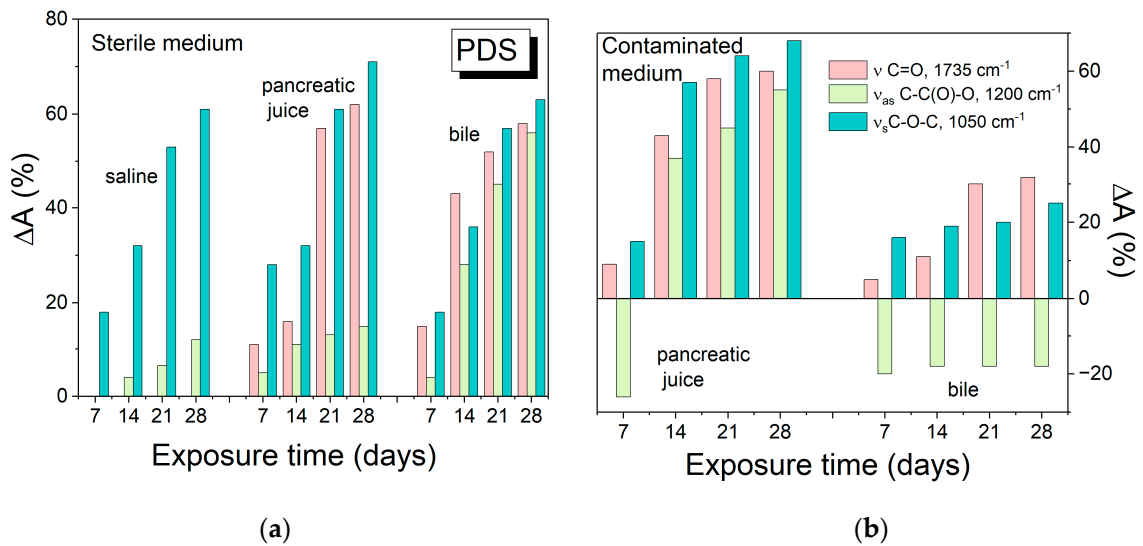


**Figure S5.** Average percentage increase in integral absorbance for degradation-sensitive bands calculated with reference absorbance before degradation for Monocryl suture. (a) Sterile and (b) contaminated media.  $\beta_s \text{CH}_2$  - deformational vibrations of the methylene group (scissoring) in a  $\epsilon$ -Caprolactone segment in the crystal phase (1418  $\text{cm}^{-1}$ ),  $\nu_{\text{as}} \text{O-C-Al}$  - asymmetric stretching vibration of the group O-C-C in  $\epsilon$ -Caprolactone segment (1090  $\text{cm}^{-1}$ ),  $\nu_{\text{as}} \text{C-C(O)-O}$  asymmetric stretching vibration of the ester group.

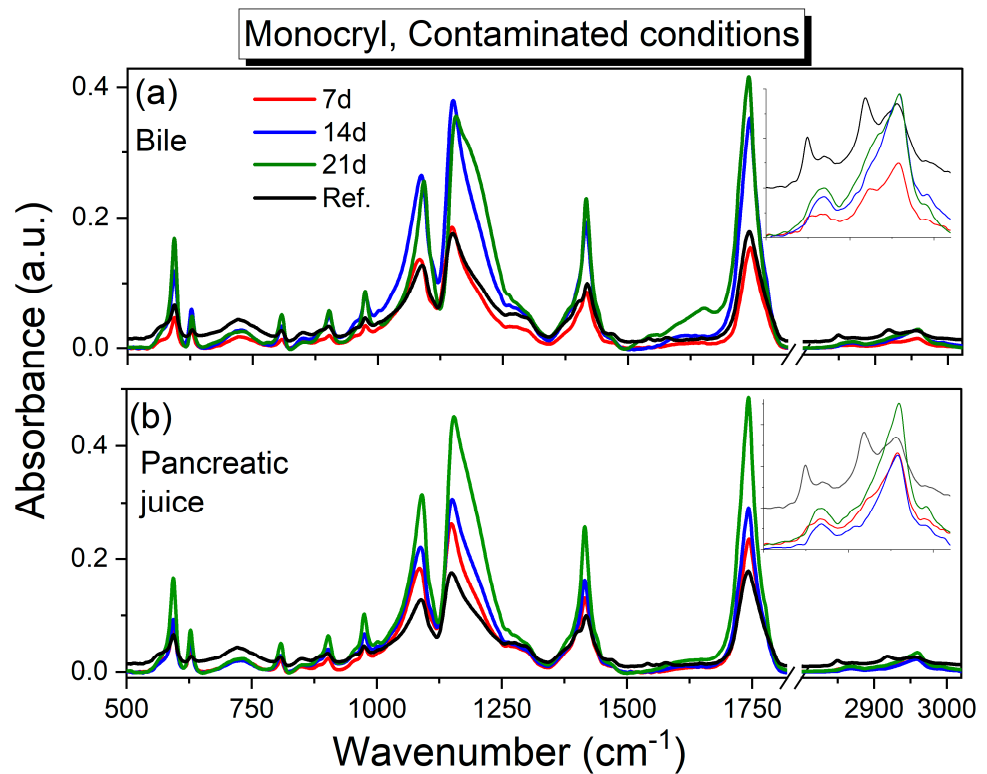


**Figure S6.** Average percentage change in integral absorbance for degradation-sensitive bands calculated with reference absorbance before degradation for Vicryl suture. (a) Sterile and (b) contaminated media.  $\nu \text{C=O}$  - stretching vibration of carbonyl group,  $\nu_{\text{as}} \text{O-C-C}$  - asymmetric stretching vibration in Glycolide seg. (1086  $\text{cm}^{-1}$ ),  $\nu_{\text{CCC}}$  - skeletal vibration (975  $\text{cm}^{-1}$ ).

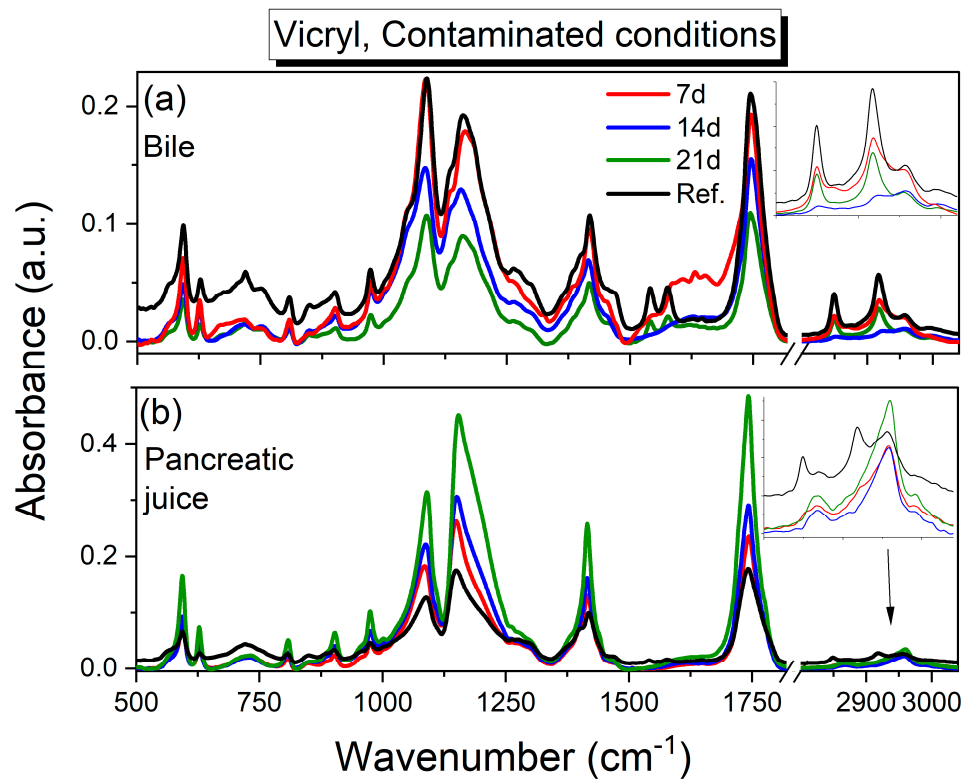




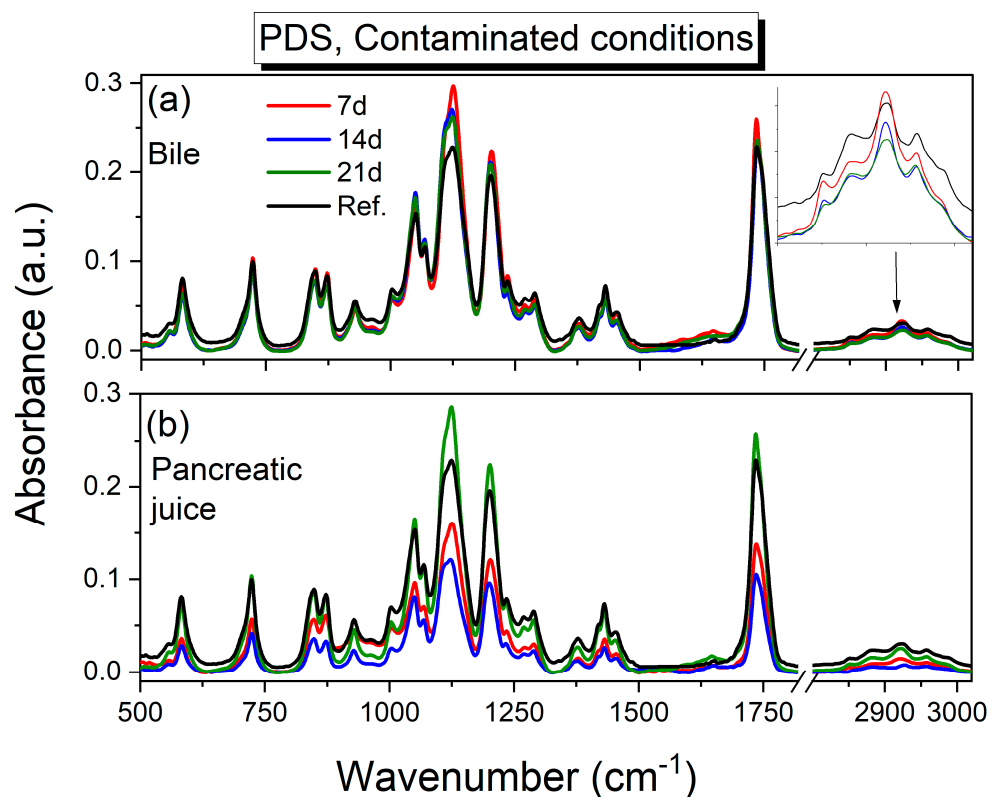
**Figure S7.** Average percentage decrease in integral absorbance for degradation-sensitive bands calculated with reference absorbance before degradation for PDS suture. (a) Sterile and (b) contaminated media.  $\nu$  C=O – stretching vibration of carbonyl group,  $\nu_{\text{as}}$  C-O-C - asymmetric stretching vibration in ether group (1050  $\text{cm}^{-1}$ ),  $\nu_{\text{as}}$  C-C(O)-O asymmetric stretching vibration of the ester group.



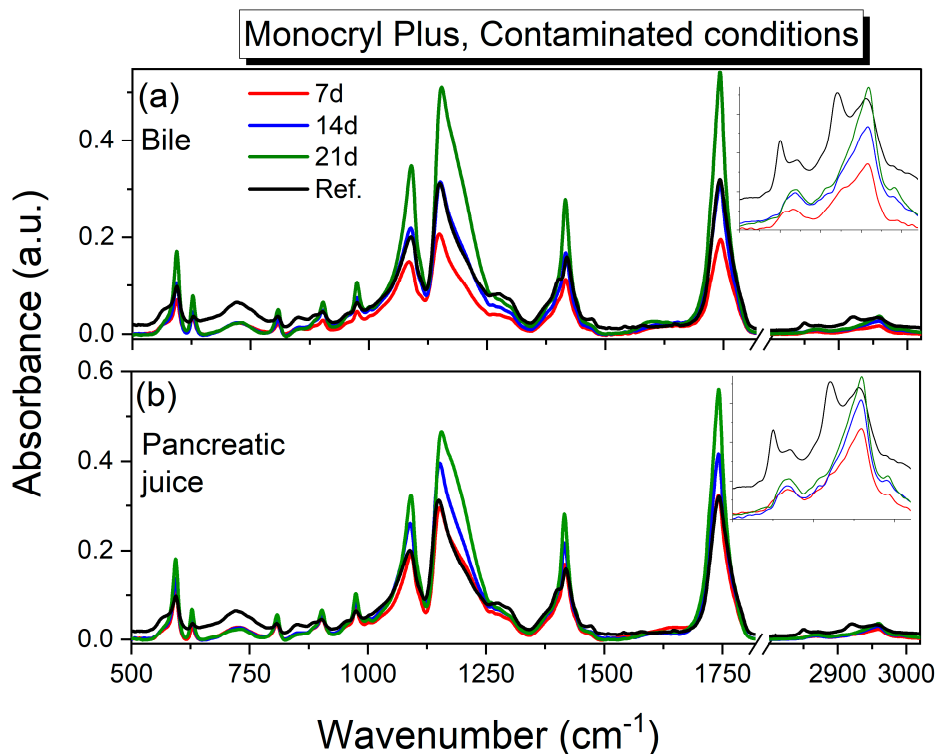
**Figure S8.** FT-IR spectra in the 500-3500  $\text{cm}^{-1}$  range for the Monocryl surgical suture immersed in contaminated environment in various body fluids for 7, 14 and 21 days. (a) bile and (b) pancreatic juice.



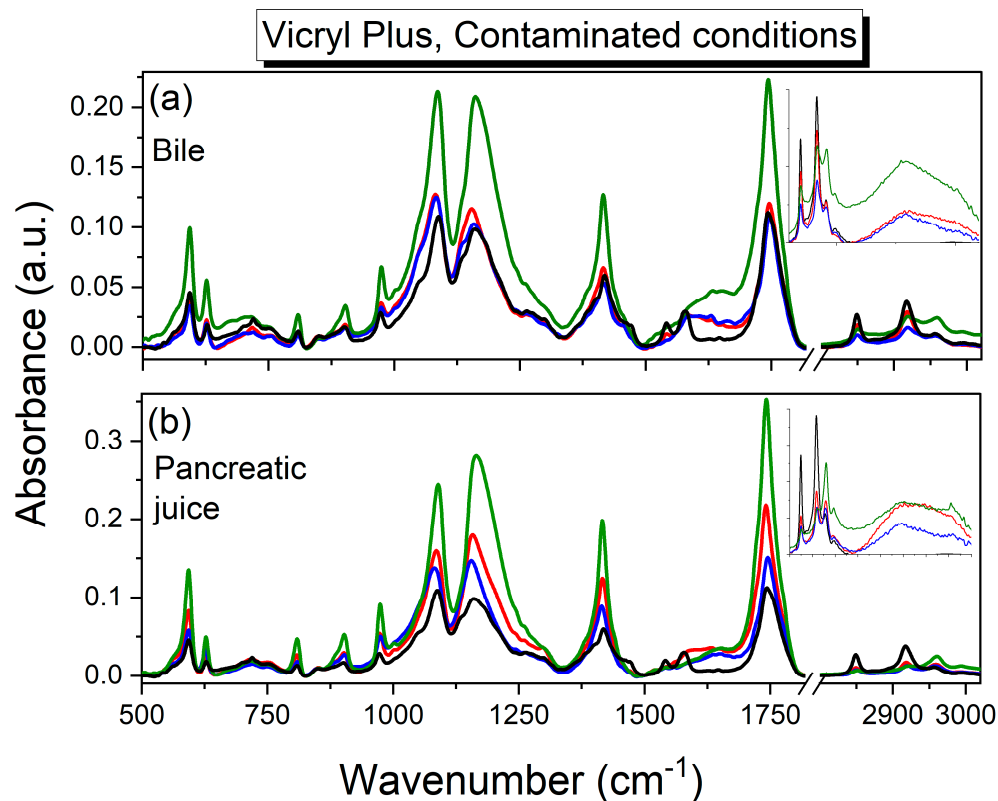
**Figure S9.** FT-IR spectra in the 500-3500 cm<sup>-1</sup> range for the Vicryl surgical suture immersed in contaminated environment in various body fluids for 7, 14 and 21 days. (a) bile and (b) pancreatic juice.



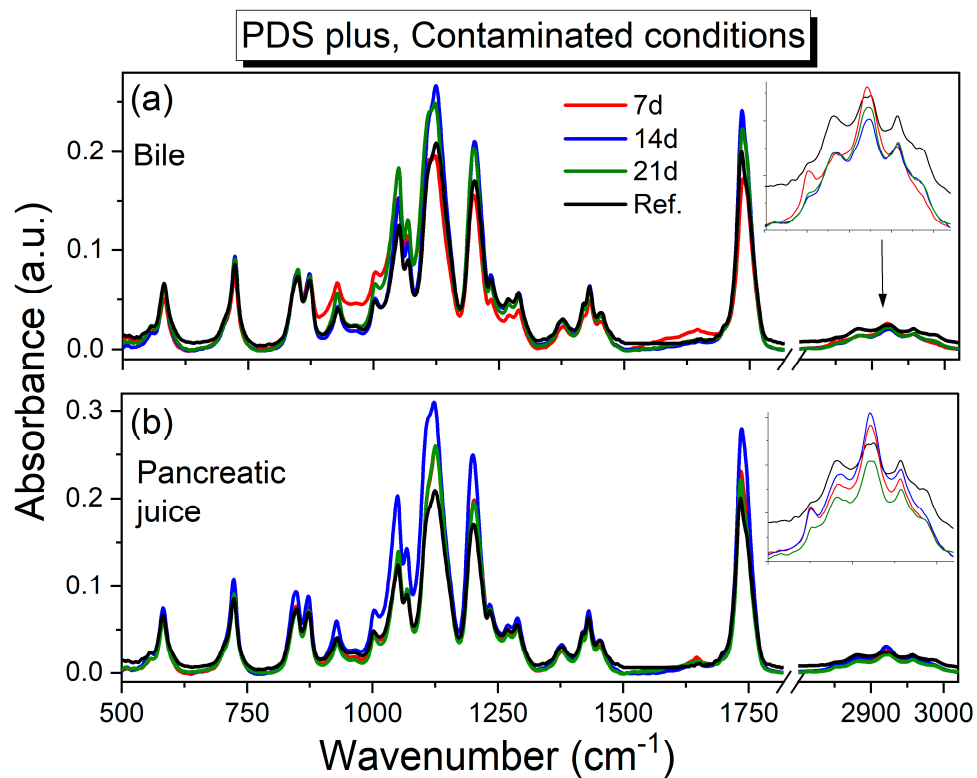
**Figure S10.** FT-IR spectra in the 500-3500 cm<sup>-1</sup> range for the PDS surgical suture immersed in contaminated environment in various body fluids for 7, 14 and 21 days. (a) bile and (b) pancreatic juice.



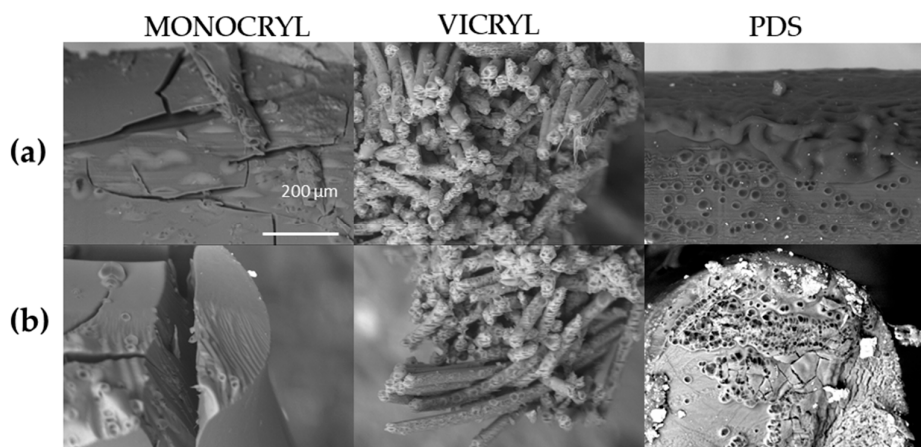
**Figure S11.** FT-IR spectra in the 500-3500  $\text{cm}^{-1}$  range for the Monocryl Plus surgical suture immersed in contaminated environment in various body fluids for 7, 14 and 21 days. (a) bile and (b) pancreatic juice.



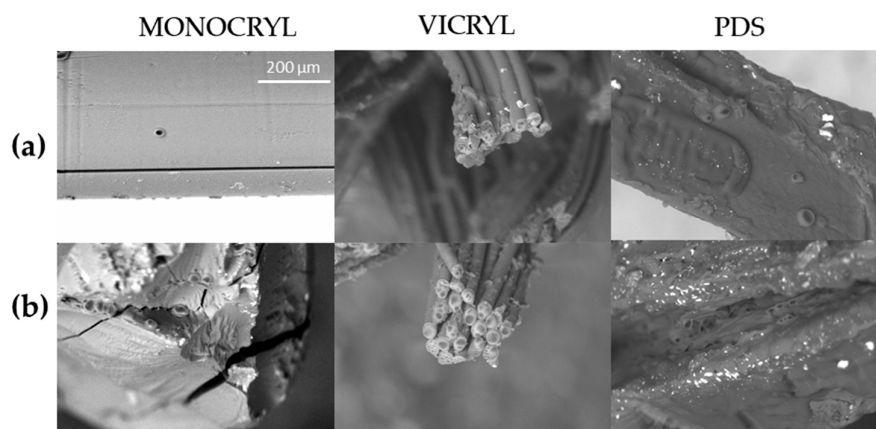
**Figure S12.** FT-IR spectra in the 500-3500  $\text{cm}^{-1}$  range for the Vicryl Plus surgical suture immersed in contaminated environment in various body fluids for 7, 14 and 21 days. (a) bile and (b) pancreatic juice.



**Figure S13.** FT-IR spectra in the 500-3500  $\text{cm}^{-1}$  range for the PDS Plus surgical suture immersed in contaminated environment in various body fluids for 7, 14 and 21 days. (a) bile and (b) pancreatic juice.



**Figure S14.** Scanning electron microscope images of uncoated surgical threads immersed for 21 days in a contaminated environment of pancreatic juice. (a) view of the side surface of the suture, (b) cross-sectional view of the suture.



**Figure S15.** Scanning electron microscope images of uncoated surgical threads immersed for 21 days in a contaminated environment of bile. (a) view of the side surface of the suture, (b) cross-sectional view of the suture.