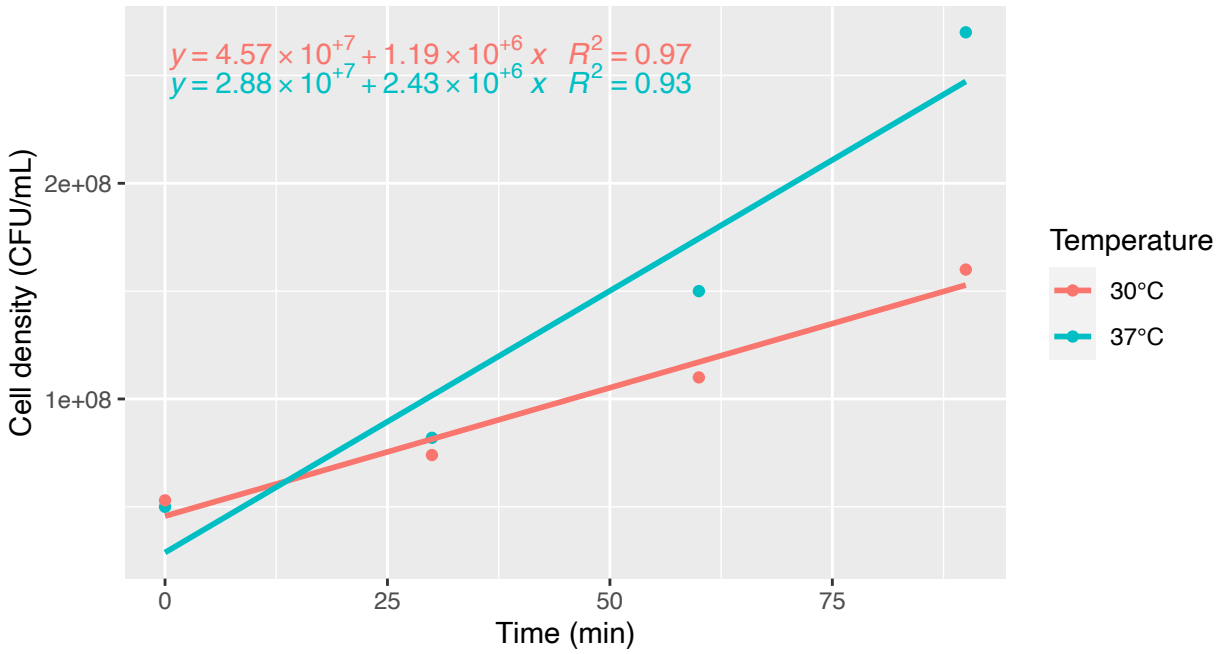

Figure 1: *E. coli* viable counts change over time in nutrient-rich medium. In this figure, the abscissa indicates the incubation time (in minutes) of E. coli at the corresponding temperature, and the ordinate indicates the cell density (CFU/ml). Different incubation temperatures are distinguished by different colors.

Table 2: Indirect method GT calculation

Formula \ Value	37°C Micro plate	30°C Micro plate	37°C Spec20	30°C Spec20
Slope $= \frac{log(y_2)-log(y_1)}{x_2-x_1}$	0.0079	0.0040	0.0216	0.0116
GT $= \frac{0.3}{Slope}$	$\frac{0.3}{0.0079} = 37.788$	$\frac{0.3}{0.0040} = 73.235$	$\frac{0.3}{0.0216} = 13.856$	$\frac{0.3}{0.0116} = 25.729$

seen that different methods have different generation times, but the data of viable count is similar to that of micro plate, while the data collected by spec20 has a large deviation. Taking the growth environment of 37 degrees as an example, the data of the first two groups is about 40 minutes, while the result of Spec20 is less than 15 minutes.

Ideally, the GT of *E. coli* is 20 minutes in an environment of 37 degrees, and it is much longer in an environment of 30 degrees, which can reach nearly one hour(Štumpf et al. 2020). There is a gap between the actual measurement results and the theoretical results. Our GT reached 40 minutes in an environment of 37 degrees, and about 80 minutes in a temperature of 30 degrees. However, comparing the results of the three different methods, it can be seen that

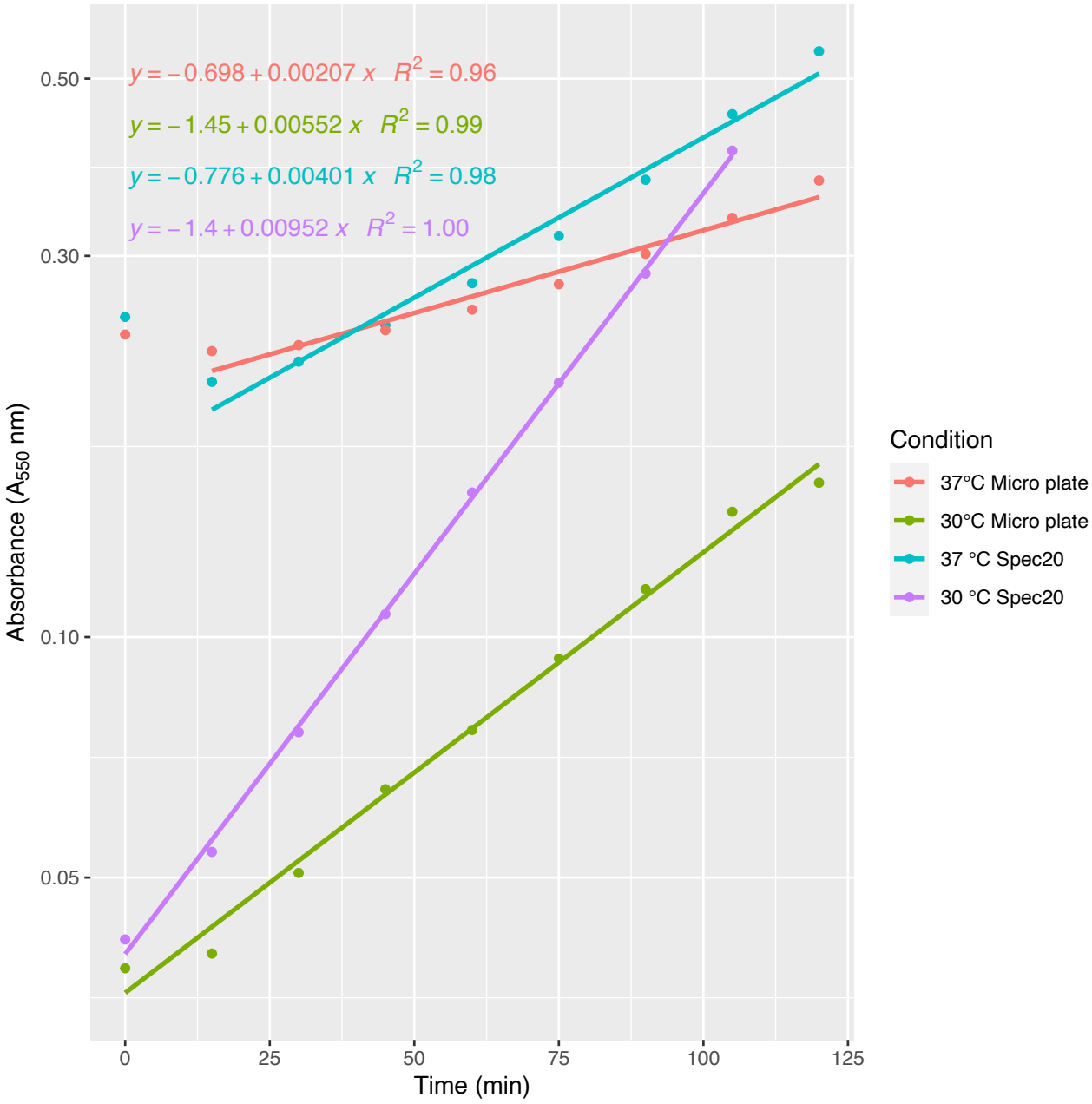

Figure 2: The relationship between the survival rate of *E. coli* on the semilog scale and the absorbance at 550 ($m\mu(nm)$) and time. In this figure, the abscissa indicates the incubation time of *E. coli*, and the ordinate is displayed after semilog transformation Absorbance at 550 ($m\mu(nm)$). The figure contains a total of four data of two temperatures and two measurement methods, and different colors are used to distinguish the conditions.