

Sirius Red Collagen Detection Kit

Catalog # 9062

For Research Use Only - Not Human or Therapeutic Use

INTRODUCTION

Sirius red is a unique dye which specifically binds to the $[\text{Gly-X-Y}]_n$ helical structure on fibrillar collagen (type I to V) and does not discriminate between collagen species and types. Therefore, this kit is designed to detect the total collagen content in various samples.

Chondrex provides a Sirius Red Collagen Detection Kit for various collagen-containing samples such as tissue specimens, cell culture medium and cultured cells. The total assay time is less than 30 minutes and 40 samples can be measured in duplicate. Due to the low level of collagen in cell culture medium, additional concentration steps may be necessary.

For determining levels of collagen from individual species or different types of samples, we recommend our type I collagen detection kits (catalog # 6008, 6012-6016) and type II collagen detection kit (catalog # 6009). These ELISA kits can use the same sample specimens you have prepared for this kit.

KIT COMPONENTS

Item	Quantity	Amount	Storage
Standard - Bovine Type I Collagen	1 vial	0.5 mg/ml, 1 ml	-20°C
Sirius Red Solution	1 bottle	50 ml	-20°C
Washing Solution	1 bottle	50 ml	-20°C/RT
Extraction Solution	1 bottle	30 ml	-20°C/RT
0.5M Acetic Acid (AcOH)	1 bottle	20 ml	-20°C/RT
96-Well Plate	1 each	8-well strips x 12	-20°C/RT

*Concentrating Solution (50 ml, catalog # 90626) for cell culture medium samples is NOT included. Please contact us to place an order.

SAMPLE PREPARATION

Tissue specimens and cultured cells can be used; however, solid samples must be solubilized for this assay. In addition, culture medium samples may require a concentration process (please see page 4 of this protocol). Also, heat denatured collagen tends to have lower binding with sirius red dye, resulting in underestimated values.

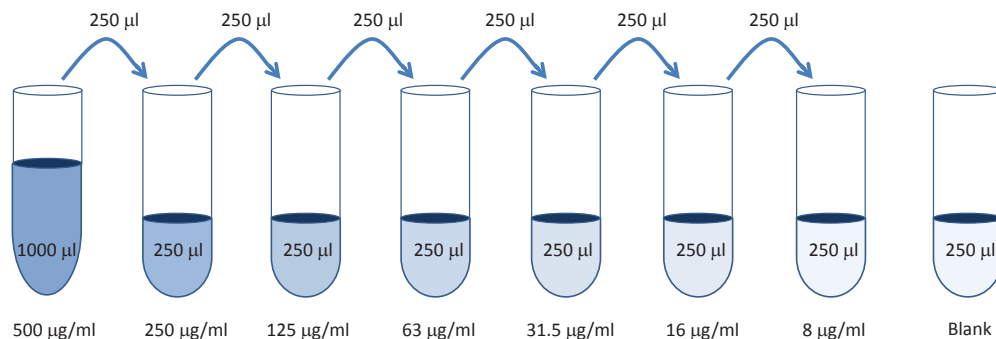
Depending on the solubilization method, these soluble collagen samples can be used:

- 1) Salt soluble collagen (0.15M NaCl in 0.1M Tris-HCl, pH 7.4)
- 2) Acid soluble collagen (0.05M acetic acid)
- 3) Pepsin-soluble collagen (0.05M acetic acid with pepsin)

We recommend our “tips for collagen solubilization” to prepare pepsin-soluble collagen samples. Please contact us for more information.

ASSAY PROCEDURES (assay should be run in duplicate)

- 1) Prepare standard solutions in 1.5 ml centrifuge tubes or disposable culture tubes: add 250 μ l of 0.5M acetic acid (Blank) to seven tubes. Mix 250 μ l of Standard (500 μ g/ml) with an equal amount of 0.05M acetic acid (250 μ g/ml). Repeat this procedure five times to make 125, 63, 31.5, 16 and 8 μ g/ml solutions.



- 2) Prepare sample solutions in 1.5 ml centrifuge tubes or disposable culture tubes: dilute samples with 0.5M acetic acid solution in the range of the standard curve (8-500 μ g/ml).
- 3) Add 100 μ l of Blank, diluted standard solutions or samples to the tubes in duplicate to 1.5 ml centrifuge tubes.
- 4) Add 500 μ l of Sirius Red Solution to each tube.
- 5) Vortex and incubate for 20 minutes at room temperature.
- 6) Spin at 10,000 rpm for 3 minutes.
- 7) Remove the supernatant by pipetting carefully without disturbing the pellet.
- 8) Add 500 μ l of Washing Solution.
- 9) Vortex and re-suspend the pellet in the Washing Solution.
- 10) Spin at 10,000 rpm for 3 minutes.
- 11) Remove the supernatant by pipetting carefully without disturbing the pellet.
- 12) Add 250 μ l of Extraction Buffer.
- 13) Vortex and completely dissolve the pellet.
- 14) Transfer 200 μ l to a 96-well plate.
- 15) Read OD at 510-550 nm.

NOTE: If there is disturbed pellet in the tube, the tube should be spun again before removing supernatant prior to transferring to a 96-well plate.

CALCULATION OF COLLAGEN CONTENT IN SAMPLES

1. Average the duplicate OD values for the standards, blanks (B) and test samples.
2. Subtract the blank (B) values from the averaged OD values of the standards and test samples.
3. Plot the OD values of standards against the $\mu\text{g/ml}$ of standard. Using a normal probability plot will linearize the data. Figure 1 shows an example of standard curves of this assay.
4. The collagen concentration ($\mu\text{g/ml}$) in test samples can be calculated using regression analysis. Then multiply by the sample dilution factor to obtain the collagen concentration in the original sample specimens.

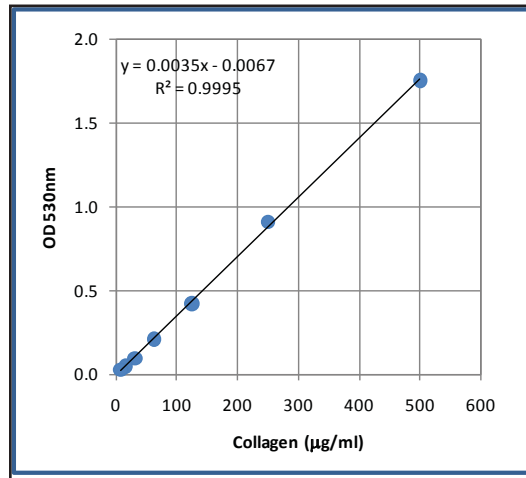


Figure 1. Typical Standard Curve

CULTURE MEDIUM

Samples containing higher concentrations of serum can cause high background values. Therefore, we recommend reducing the serum supplement concentration or dilute the cell culture medium down to 5% using PBS.

SAMPLE CONCENTRATION

The concentration of collagen in culture media is generally low, therefore it is difficult to detect collagen in the standard range of this kit. We recommend a sample concentration process using our Concentrating Solution (catalog # 90626). Furthermore, a negative control of medium should be used since this concentration method may result in elevated background levels.

- 1) Take 1 ml culture medium.
- 2) Add 250 μl of Concentrating Solution.
- 3) Vortex and incubate at 4°C for 16-24 hours.
- 4) Spin at 10,000 rpm for 3 minutes.
- 5) Discard supernatant.
- 6) Add 100 μl of 0.05M acetic acid.
- 7) Dissolve pellet and use it as a sample.
- 8) Calculated collagen concentration will be multiplied by 0.1 as the dilution factor.