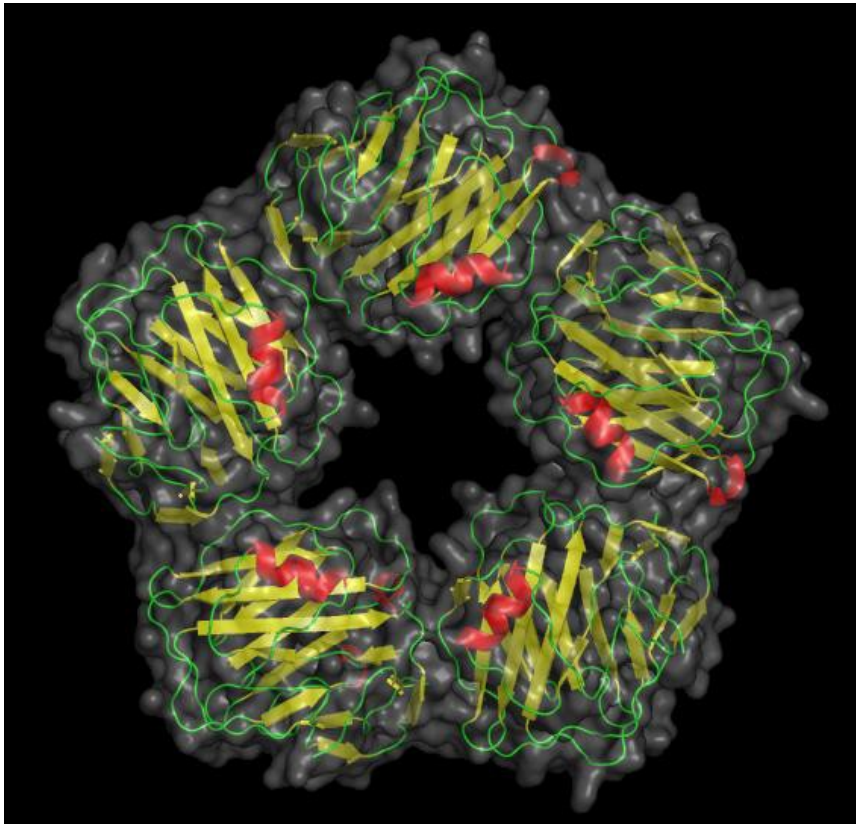


# What is CRP



C-reactive protein, CRP

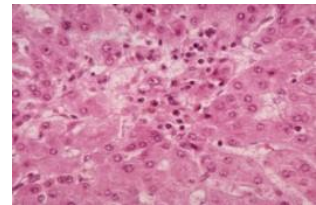
CRP (mg/L)	
Discovery time	1930
Characteristics	Acute phase reactive protein
Site of synthesis	Liver
Clinical feature	<ul style="list-style-type: none"><li>• Increased significantly in bacterial infection</li><li>• Generally doesn't increase or decrease slightly during virus infection</li></ul>
Concentration change	<ul style="list-style-type: none"><li>• Rise stage: 4~6 hours</li><li>• Platform stage: 24~48 hours</li><li>• Half-life stage: 18 hours</li></ul>
Indicator	Local bacterial infection, auxiliary diagnosis of inflammation

# CRP Function

- ✓ CRP generates when the body is stimulated by inflammatory irritations, such as



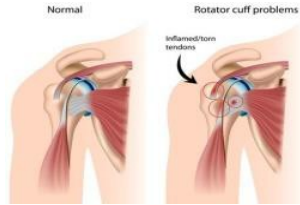
Bacterial infection



Tissue necrosis

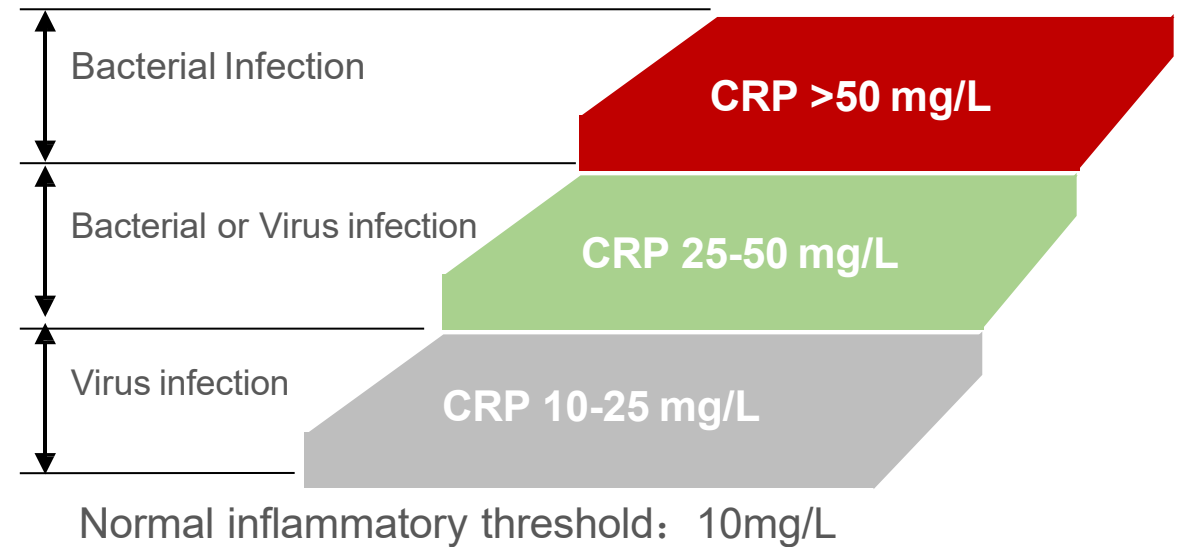


Inflammatory



Tissue injury

- ✓ **Bacterial** or **virus** infection can be identified based on the concentration.



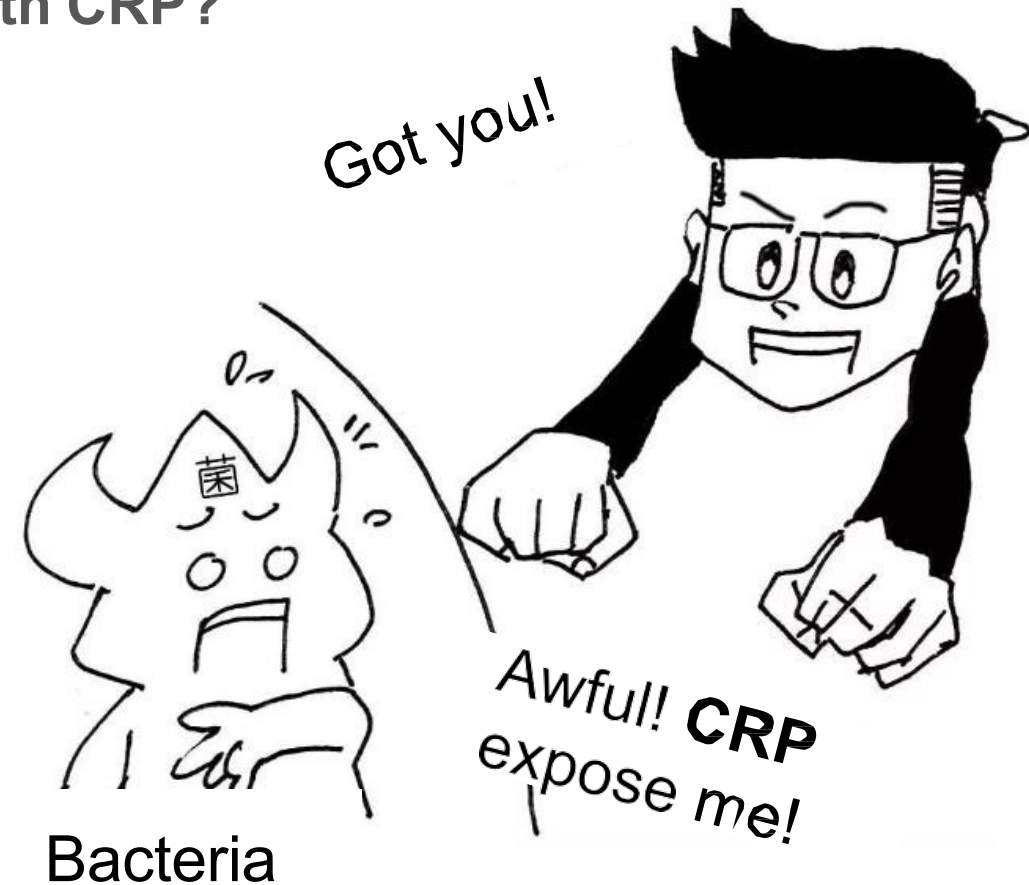
- ✓ CRP will drop quickly after infection disappear
- ✓ Closely monitor the progress and recovery of diseases
- ✓ The detection range is 5~200mg/L

# CRP Clinical Significance

*Hycel*

## Why does 5-Part Hematology analyzer combine with CRP?

- ✓ Identify bacterial or virus infections (preferred indicator)
- ✓ WBC could be affected by age/day and night/pregnancy/drug while CRP not
- ✓ Monitor infection (after surgery and childbirth)
- ✓ Observing antibiotic effect, guiding and monitoring treatment
- ✓ Risk assessment and treatment guidance for cardiovascular diseases (hs-CRP)



# Case study in COVID-19



## Study on of 140 patients

- ✓ Conclusion:
- ✓ 91.9% patients has increased CRP level, and this results up to 96.4% when comes to severe patients

Laboratory parameters	All patients (n = 138)	Disease severity		P value
		Nonsevere patients (n = 82)	Severe patients (n = 56)	
Leukocytes ( $\times 10^9/L$ ; normal range 3.5-9.5)	4.7 (3.7-6.7)	4.5 (3.5-5.9)	5.3 (4.0-9.0)	.014
Increased—No./total No. (%)	17/138 (12.3)	4/82 (4.9)	13/56 (23.2)	.003
Decreased—No./total No. (%)	27/138 (19.6)	18/82 (22.0)	9/56 (16.1)	.513
Lymphocytes ( $\times 10^9/L$ ; normal range 1.1-3.2)	0.8 (0.6-1.1)	0.8 (0.6-1.2)	0.7 (0.5-1.0)	.048
Decreased—No./total No. (%)	104/138 (75.4)	58/82 (70.7)	46/56 (82.1)	.160
Lymphocyte percentage (%; normal range 20-50)	16.9 (9.2-26.0)	20.0 (12.5-28.4)	12.7 (7.7-22.0)	<.001
Eosinophils ( $\times 10^9/L$ ; normal range 0.02-0.52)	0.01 (0.0-0.05)	0.02 (0.008-0.05)	0.01 (0.0-0.06)	.451
Decreased—No./total No. (%)	73/138 (52.9)	39/82 (47.6)	34/56 (60.7)	.165
Eosinophils percentage (%; normal range 0.4-8)	0.3 (0.0-1.0)	0.5 (0.08-1.0)	0.2 (0.0-0.8)	.166
D-Dimer ( $\mu g/mL$ ; normal range 0-0.243)	0.2 (0.1-0.5)	0.2 (0.1-0.3)	0.4 (0.2-2.4)	<.001
Increased—No./total No. (%)	35/81 (43.2)	12/43 (27.9)	23/38 (60.5)	.004
C-reactive protein (CRP) (mg/L; normal range 0-3)	34.2 (12.5-67.4)	28.7 (9.5-52.1)	47.6 (20.6-87.1)	<.001
Increased—No./total No. (%)	125/136 (91.9)	72/81 (88.9)	53/55 (96.4)	.199
Procalcitonin (PCT) (ng/mL; normal range 0-0.1)	0.07 (0.04-0.1)	0.05 (0.03-0.1)	0.1 (0.06-0.3)	<.001
Increased—No./total No. (%)	41/118 (34.7)	16/68 (23.5)	25/50 (50.0)	.004
Serum amyloid A (SAA) (mg/L; normal range 0-10)	92.53 (44.6-161.3)	91.5 (24.9-163.2)	108.4 (54.1-161.6)	.600
Increased—No./total No. (%)	46/51 (90.2)	29/34 (85.3)	17/17 (100.0)	.156
Serum Creatine Kinase (U/L; normal range 40-200)	72.5 (52.2-115)	83.0 (56.0-112.0)	66.0 (38.5-144.0)	.192
Increased—No./total No. (%)	4/60 (6.7)	1/35 (2.8)	3/25 (12.0)	.298

Note: Data are shown as median (IQR); COVID-19, coronavirus disease 2019; IQR, interquartile range; P values denoted the comparison between nonsevere and severe subgroups.