

PEPTIDES AND DERIVATIVES detection (d) and recognition (r) flavour and taste threshold values in water and other media

Abbreviations or symbols for amino acids *)

Alanine	Ala	Histidine	His	Serine	Ser
Arginine	Arg	Isoleucine	Ile	Threonine	Thr
Asparagine	Asp or Asn	Leucine	Leu	Tryptophan	Trp
Cysteine	Cys	Lysine	Lys	Tyrosine	Tyr
Glutamic acid	Glu or Gln	Methionine	Met	Valine	Val
Glutamine	Gln	Phenylalanine	Phe		
Glycine	Gly	Proline	Pro		

Other abbreviations or symbols

2-Aminobutyric acid	Abu	2,4-Diaminobutyric acid	Dab
2-Aminobutyric acid	α -Abu	Ethyl	Et
4-Aminobutyric acid	γ -Abu	Hexyl	n-Hex
2-Aminobutyric acid	A ₂ bu	Hydrogen chloride	HCl
Acetyl	Ac	Isoamyl	i-Am
Acetic acid	AcOH	Isopropyl	i-Pr
α -Aminoisobutyric acid	Aib	Isovaline	Iva
β -Alanine	β -Ala	Methyl	Me
Amyl	n-Am	Norleucine	Nle
Aminomalonic acid	Ama	Norvaline	Nva
2,3-Diaminopropionic acid	A ₂ Pr ³	Ornithine	Orn
Benzoyl	Bz	Propyl	Pr
Butyl	Bu	L-Pyrenylalanine	Pya

*) IUPAC-IUB commission on biochemical nomenclature symbols for amino-acid derivatives and peptides recommendations (1971), J. Biol. Chem., **247**(1972), 977-983

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A

γ -Abu-L-Lys.HCl Tada <i>et al.</i> (1984); Nosho <i>et al.</i> (1990)	r	1.56 mM (sweet/sour taste)
γ -Abu-L-Orn.HCl Tada <i>et al.</i> (1984)	r	2.89 mM (sweet/sour taste)
A ₂ bu- γ -Abu.HCl Tada <i>et al.</i> (1984)	r	1.56 mM (salty taste)
A ₂ bu- β -Ala.HCl Tada <i>et al.</i> (1984)	r	1.56 mM (umami taste)
A ₂ bu-Gly.HCl Tada <i>et al.</i> (1984)	r	2.36 mM (umami taste)
A ₂ bu-L-Tau.HCl Tada <i>et al.</i> (1984)	r	1.56 mM (sour/salty taste)
A ₂ Pr ³ - β -Ala.HCl Tada <i>et al.</i> (1984)	r	6.25 mM (umami taste)
A ₂ Pr ³ -Gly.HCl Tada <i>et al.</i> (1984)	r	2.44 mM (umami taste)
A ₂ Pr ³ -L-Tau.HCl Tada <i>et al.</i> (1984)	r	5.50 mM (sour/sweet taste)
Ac-Gly-L-Leu [29852-55-9] Wieser & Belitz (1976)	r	4,400 - 4,800 mg/kg (bitter taste)
Ac-Gly-L-Leu-OMe Wieser & Belitz (1976)	r	3 - 5 mM (bitter taste)
Ac-L-Leu-Gly [4033-42-5] Wieser & Belitz (1976)	r	4,600 - 5,100 mg/kg (bitter taste)
Ac-L-Leu-Gly-OMe Wieser & Belitz (1976)	r	4 - 5 mM (bitter taste)
Ac-L-Leu-L-Leu Matoba & Hata (1972)		5 mM
Ac-L-Leu-L-Leu-OMe Matoba & Hata (1972)		0.23 mM
Ac-L-Leu-L-Phe Matoba & Hata (1972)		2.5 mM
Ac-L-Leu-L-Phe-OMe Matoba & Hata (1972)		0.078 mM
Ac-L-Orn(Ac)- β -Ala Seki <i>et al.</i> (1990a)	r	1.23 mM (sour taste)

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Ac-L-Orn- β -Ala Seki <i>et al.</i> (1990a)	r	4.95 mM (sweet/sour taste)
δ -Ac-L-Orn- β -Ala Seki <i>et al.</i> (1990b)	r	3.50 mM (sweet taste)
δ -Ac-L-Orn- β -Ala-OMe Seki <i>et al.</i> (1990b)	r	3.13 mM (bitter taste)
δ -Ac-L-Orn-L-Pro-L-Pro-L-Phe-L-Ile-L-Val Kanehisa & Okai (1984)	r	0.60 mM (bitter taste)
Ac-L-Phe-L-Leu Matoba & Hata (1972) Wieser & Belitz (1976)	r	2.5 mM 0.9 - 1.1 mM (bitter taste)
Ac-D-Phe-L-Leu Matoba & Hata (1972)		2.5 mM
Ac-L-Phe-L-Leu-OMe Matoba & Hata (1972) Wieser & Belitz (1976)	r	0.078 mM 0.02 - 0.04 mM (bitter taste)
Ac-D-Phe-L-Leu-OMe Matoba & Hata (1972)		0.078 mM
Ac-D-Phe-L-Lys Nosho <i>et al.</i> (1990)	r	0.32 mM (sweet/sour/bitter taste)
Ac-L-Phe-L-Lys [14287-21-9] Nosho <i>et al.</i> (1990)	r	75 mg/kg (sweet/sour taste)
Ac-L-Phe-L-Phe [10030-31-6] Matoba & Hata (1972)		460 mg/kg
Ac-L-Phe-L-Phe-OMe Matoba & Hata (1972)		0.078 mM
L-Ala-L-Ala [1948-31-8] Kirimura <i>et al.</i> (1969) Ishibashi <i>et al.</i> (1988a); Tamura <i>et al.</i> (1990b)	r	> 2,000 mg/kg 960 mg/kg (sweet taste)
L-Ala-L-Ala-L-Ala [5874-90-8] Ishibashi <i>et al.</i> (1988a); Tamura <i>et al.</i> (1990b)	r	700 mg/kg (sweet taste)
L-Ala-L-Ala-Gly [16422-07-4] Ishibashi <i>et al.</i> (1988a)	r	4,130 mg/kg (sweet taste)
L-Ala-L-Ala-L-Leu Wieser & Belitz (1975b)	r	50 - 100 mM (bitter taste)
L-Ala-L-Asp [20727-65-5] Ohyama <i>et al.</i> (1988)	r	2,650 mg/kg (umami taste)
Ohyama <i>et al.</i> (1988)	r	1,220 mg/kg (bitter taste)
D-Ala-L-Asp-D-Ala-L-Ala-OMe Ariyoshi <i>et al.</i> (1990)	r	6,000 mg/kg (sweet taste)

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D-Ala-L-Asp-D-Ala-OMe Ariyoshi <i>et al.</i> (1990)	r	< 500 mg/kg (sweet taste)
L-Ala-L-Asp-D-Ala-OMe Ariyoshi <i>et al.</i> (1990)	r	6,000 mg/kg (sweet taste)
D-Ala-L-Asp-D-Ala-OPr Ariyoshi <i>et al.</i> (1990)	r	< 200 mg/kg (sweet taste)
D-Ala-L-Asp-L-Phe-OMe Ariyoshi <i>et al.</i> (1990)	r	< 35 mg/kg (sweet taste)
L-Ala-L-Asp-L-Phe-OMe Ariyoshi <i>et al.</i> (1990)	r	< 6,000 mg/kg (sweet taste)
D-Ala-L-Asp-D-Val-OMe Ariyoshi <i>et al.</i> (1990)	r	< 6,000 mg/kg (sweet taste)
D-Ala-L-Asp-D-Val-L-Val-OMe Ariyoshi <i>et al.</i> (1990)	r	6,000 mg/kg (sweet taste)
Ala-Glu Noguchi <i>et al.</i> (1975)		2,000 mg/kg
L-Ala-L-Glu [13187-90-1] Ohyama <i>et al.</i> (1988)	r	330 mg/kg (umami taste)
Van den Oord & Wassenaar (1997)	r	> 580 mg/kg
L-Ala-L-Glu-L-Ala Van den Oord & Wassenaar (1997)	r	> 10.0 mM
L-Ala-Gly [687-69-4] Kirimura <i>et al.</i> (1969)		> 2,000 mg/kg
β -Ala-Gly [2762-88-0] Dunkel & Hofmann (2009)	r	63 mM
L-Ala-Gly-L-Ala Ishibashi <i>et al.</i> (1988a)	r	650 mg/kg (sweet taste)
L-Ala-Gly-Gly [3146-40-5] Ishibashi <i>et al.</i> (1988a)	r	3,860 mg/kg (sweet taste)
β -Ala-N-Me-L-His Sonntag <i>et al.</i> (2010)	r	8.56 mM (thick-sour and mouth-drying)
L-Ala-L-Ile-L-Ala Wieser & Belitz (1975b)	r	50 - 100 mM (bitter taste)
L-Ala-L-Leu [3303-34-2] Wieser & Belitz (1976)	r	3,640 - 4,450 mg/kg (bitter taste)
β -Ala-L-Lys.HCl [90970-40-4] Tada <i>et al.</i> (1984)	r	1,190 mg/kg (sweet/sour taste)
Ala-Lys-Tyr		

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Kawakami <i>et al.</i> (1995)	r	5.3 mM (bitter taste)
Kawakami <i>et al.</i> (1995)	r	0.7 mM (sweet taste)
β -Ala-L-Orn.HCl Tada <i>et al.</i> (1984)	r	4.82 mM (sour/sweet taste)
Ala-Orn-Tyr Kawakami <i>et al.</i> (1995)	r	0.1 mM (sweet taste)
L-Ala-L-Phe [3061-90-3] Ishibashi <i>et al.</i> (1987b)	r	2,950 mg/kg (bitter taste)
Asao <i>et al.</i> (1987)	r	3,620 mg/kg (bitter taste)
L-Ala-D-Phe-OMe Shinoda & Okai (1985)		1.4 mM (bitter taste)
L-Ala-L-Phe-OMe Shinoda & Okai (1985)		1.2 mM (bitter taste)
L-Ala-L-Val [3303-45-5] Wieser & Belitz (1976)	r	11,300 - 15,100 mg/kg (bitter taste)
DL-Ama-D-Ala-OMe Ariyoshi <i>et al.</i> (1990)	r	< 110 mg/kg (sweet taste)
L-Anserine, see: L-ANSERINE in water section		
L-Anserine.HNO ₃ , see: L-ANSERINE NITRATE in water section		
L-Arg-L-Arg [15483-27-9] Otagiri <i>et al.</i> (1985); Ishibashi <i>et al.</i> (1988b,c)	r	2,640 - 3,140 mg/kg (bitter taste)
L-Arg-L-Arg-L-Arg Otagiri <i>et al.</i> (1985); Ishibashi <i>et al.</i> (1988b)	r	4 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Phe-L-Phe Otagiri <i>et al.</i> (1985)	r	0.02 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Pro-Gly-D-Phe Shinoda <i>et al.</i> (1986c)	r	0.14 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Pro-Gly-L-Phe Shinoda <i>et al.</i> (1986c)	r	0.04 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Pro-D-Phe-D-Phe Shinoda <i>et al.</i> (1986c)	r	0.03 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Pro-D-Phe-L-Phe Shinoda <i>et al.</i> (1986c)	r	0.006 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Pro-L-Phe-D-Phe Shinoda <i>et al.</i> (1986c)	r	0.04 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Pro-L-Phe-L-Phe Otagiri <i>et al.</i> (1985); Shinoda <i>et al.</i> (1986c)	r	0.007 mM (bitter taste)
L-Arg-L-Arg-L-Pro-L-Pro-L-Pro-L-Phe-L-Phe-L-Phe Otagiri <i>et al.</i> (1985)	r	0.002 mM (bitter taste)

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L-Arg-Gly		
Otagiri <i>et al.</i> (1983); Ishibashi <i>et al.</i> (1988b)	r	10 mM (bitter taste)
Otagiri <i>et al.</i> (1985)	r	8 mM (bitter taste)
Ishibashi <i>et al.</i> (1988c)	r	9.5 mM (bitter taste)
L-Arg-Gly-Gly-L-Phe-L-Ile-L-Val		
Miyake <i>et al.</i> (1983)	r	0.80 mM (bitter taste)
L-Arg-Gly-L-Phe-L-Phe		
Noshio <i>et al.</i> (1985)	r	0.16 mM (bitter taste)
L-Arg-Gly-L-Pro		
Otagiri <i>et al.</i> (1983); Ishibashi <i>et al.</i> (1988b)	r	13 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Glu-L-Pro-L-Ile-L-Ile-L-Val		
Nakatani <i>et al.</i> (1994)	r	0.031 mM (bitter taste)
L-Arg-Gly-L-Pro-Gly-L-Pro-L-Ile-L-Ile-L-Val		
Nakatani <i>et al.</i> (1994)	r	0.083 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Lys-L-Pro-L-Ile-L-Ile-L-Val		
Nakatani <i>et al.</i> (1994)	r	0.016 mM (bitter taste)
L-Arg-Gly-D-Pro-L-Phe-L-Ile-L-Val		
Miyake <i>et al.</i> (1983)	r	0.32 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Phe-L-Ile-L-Val		
Miyake <i>et al.</i> (1983); Otagiri <i>et al.</i> (1983)	r	0.05 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Phe-L-Pro-L-Ile.2AcOH		
Aoyagi & Izumiya (1977)	r	100 - 200 mg/kg (bitter)
L-Arg-Gly-L-Pro-L-Phe-L-Pro-L-Ile-L-Ile-L-Val		
Kanehisa <i>et al.</i> (1984); Shinoda <i>et al.</i> (1985); Tamura <i>et al.</i> (1990b); Nakatani <i>et al.</i> (1994)	r	0.004 mM (bitter taste)
L-Arg-Gly-L-Pro-D-Phe-L-Pro-L-Ile-L-Ile-L-Val		
Nakatani <i>et al.</i> (1994)	r	0.083 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Phe-L-Pro-L-Ile-L-Val		
Kanehisa <i>et al.</i> (1984); Shinoda <i>et al.</i> (1985)	r	0.11 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Pro-Gly-Gly-Gly-L-Phe-L-Phe		
Otagiri <i>et al.</i> (1984)	r	0.11 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Pro-Gly-Gly-L-Phe		
Otagiri <i>et al.</i> (1984)	r	0.82 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Pro-Gly-Gly-L-Phe-L-Phe		
Otagiri <i>et al.</i> (1984)	r	0.08 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Pro-Gly-Gly-L-Val		
Otagiri <i>et al.</i> (1984)	r	3.30 mM (bitter taste)
L-Arg-Gly-L-Pro-L-Pro-Gly-L-Ile-Gly		
Otagiri <i>et al.</i> (1984)	r	1.70 mM (bitter taste)