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**Corrigendum**

# Corrigendum: Global well-posedness and stability of constant equilibria in parabolic-elliptic chemotaxis systems without gradient sensing (2019 *Nonlinearity* 32 1327–51)

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There was a miscalculation in the proof of lemma 4.2 when using Young's inequality. In this corrigendum, we provide the correct version. The authors would like to thank professor Zhian Wang for pointing out the error. The authors also would like to thank the referees for their careful review and valuable suggestion.

– The terms $C\int_\Omega |\varphi(v)|^p v$ in (4.22) and (4.23) on page 1340 should be replaced by $C\int_\Omega (|\varphi(v)|^p v)^p$, because Young's inequality yields

$$\left|\frac{u}{\varphi(v)}\right|^p = \left|\frac{u}{v^{\frac{1}{p+1}}\varphi(v)^{\frac{p}{p+1}}}\right|^p \cdot \left|\frac{v}{\varphi(v)}\right|^{\frac{p}{p+1}} \leqslant C\left|\frac{u}{\varphi(v)}\right|^p\frac{u}{v} + C\left|\frac{v}{\varphi(v)}\right|^p,$$

and

$$u^p = \frac{u^p}{(|\varphi(v)|^p v)^{\frac{p}{p+1}}}\cdot(|\varphi(v)|^p v)^{\frac{p}{p+1}} \leqslant C\left|\frac{u}{\varphi(v)}\right|^p\frac{u}{v} + C(|\varphi(v)|^p v)^p,$$

where $C$ is a positive number independent of $p > 1$.

This correction leads to the following minor corrections:

– The terms $C\int_\Omega v^{k+1}$ in (4.24) and (4.25) on page 1340 should be replaced by $C\int_\Omega v^{(k+1)p}$.
– Line 3 on page 1341 should be replaced by the following:

We next consider the case $n = 3$. If $k < 1$, we choose $p > \frac{3}{2}$ satisfying

– The rightmost term $C\int_\Omega v^{k+1}$ of (4.28) on page 1341 should be replaced by $C\int_\Omega v^{(k+1)p}$.
– Line 8 and (4.29) on page 1341 should be replaced by the following:
Since $(k+1)p < k+2 < 3$, by (2.3), we have

$$C\int_\Omega v^{p-k} + C\int_\Omega v^{(k+1)p} \leqslant C. \tag{4.29}$$

– Line 12 on page 1341 should be replaced by the following:
i.e. (4.19) is obtained. On the other hand, if $1 \leqslant k < 2$, we choose $p > \frac{3}{2}$ satisfying
– Line 16–18 on page 1341 should be replaced by the following:
Owing to (4.3), (4.30) and (4.31), there is a positive number $C$ fulfilling (4.21). Repeating the procedure (4.22)–(4.24), (4.28) is obtained. Since $kp < 3 < (k+1)p$, due to (2.5), we have by Young's inequality and the interpolation inequality that

$$C\int_\Omega v^{p-k} + C\int_\Omega v^{(k+1)p} \leqslant C + C\|v\|^{(k+1)p}_{L^{(k+1)p}(\Omega)} \leqslant C + C\|v\|^{\frac{kp+3}{2}}_{L^{\frac{kp+3}{2}}(\Omega)}\|v\|^{\frac{kp+2p-3}{2}}_{L^\infty(\Omega)}.$$

Applying the standard elliptic regularity theory to the second equation of (1.6), we note that there is a positive constant $C = C(\varepsilon, p, \Omega)$ satisfying $\|v\|_{L^\infty(\Omega)} \leqslant C\|u\|_{L^p(\Omega)}$. As $\frac{kp+3}{2} < 3$, we also have from (2.3) that $\|v\|_{L^{\frac{kp+3}{2}}(\Omega)} \leqslant C$, which along with Young's inequality leads to

$$C\int_\Omega v^{p-k} + C\int_\Omega v^{(k+1)p} \leqslant C + C\|u\|^{\frac{kp+2p-3}{2}}_{L^p(\Omega)} \leqslant C + \frac{1}{2}\int_\Omega u^p.$$

Thus, analogously to the above case $k < 1$, (4.19) is obtained.

– The last three lines on page 1341 should be replaced by the following:

According to (4.3), (4.32) and (4.33), there is a positive number $C$ satisfying (4.21). Repeating the procedure (4.22)–(4.24), we have (4.28). Note that there is a positive constant $C = C(\varepsilon, n, p, \Omega)$ satisfying $\|v\|_{L^\infty(\Omega)} \leqslant C\|u\|_{L^p(\Omega)}$ by the standard elliptic regularity theory. As we have

$$\int_\Omega v^{p-k} \leqslant C \text{ if } p-k < \frac{n}{n-2} \quad \text{and} \quad \int_\Omega v^{p-k} \leqslant C + \int_\Omega v^{(k+1)p} \text{ if } p-k \geqslant \frac{n}{n-2},$$

it follows from (2.3), $kp < \frac{n}{n-2} < (k+1)p$, the interpolation inequality and Young's inequality that

$$C\int_\Omega v^{p-k} + C\int_\Omega v^{(k+1)p} \leqslant C + C\|v\|^{(k+1)p}_{L^{(k+1)p}(\Omega)} \leqslant C + C\|v\|^{\frac{2kp}{n}+1}_{L^{\frac{2kp}{n}+1}(\Omega)}\|v\|^{kp(\frac{n-2}{n})+p-1}_{L^\infty(\Omega)}$$

$$\leqslant C + C\|u\|^{kp(\frac{n-2}{n})+p-1}_{L^p(\Omega)} \leqslant C + \frac{1}{2}\int_\Omega u^p.$$

Therefore, by (4.28) and lemma 2.4, (4.19) is obtained. This completes the proof. □

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